

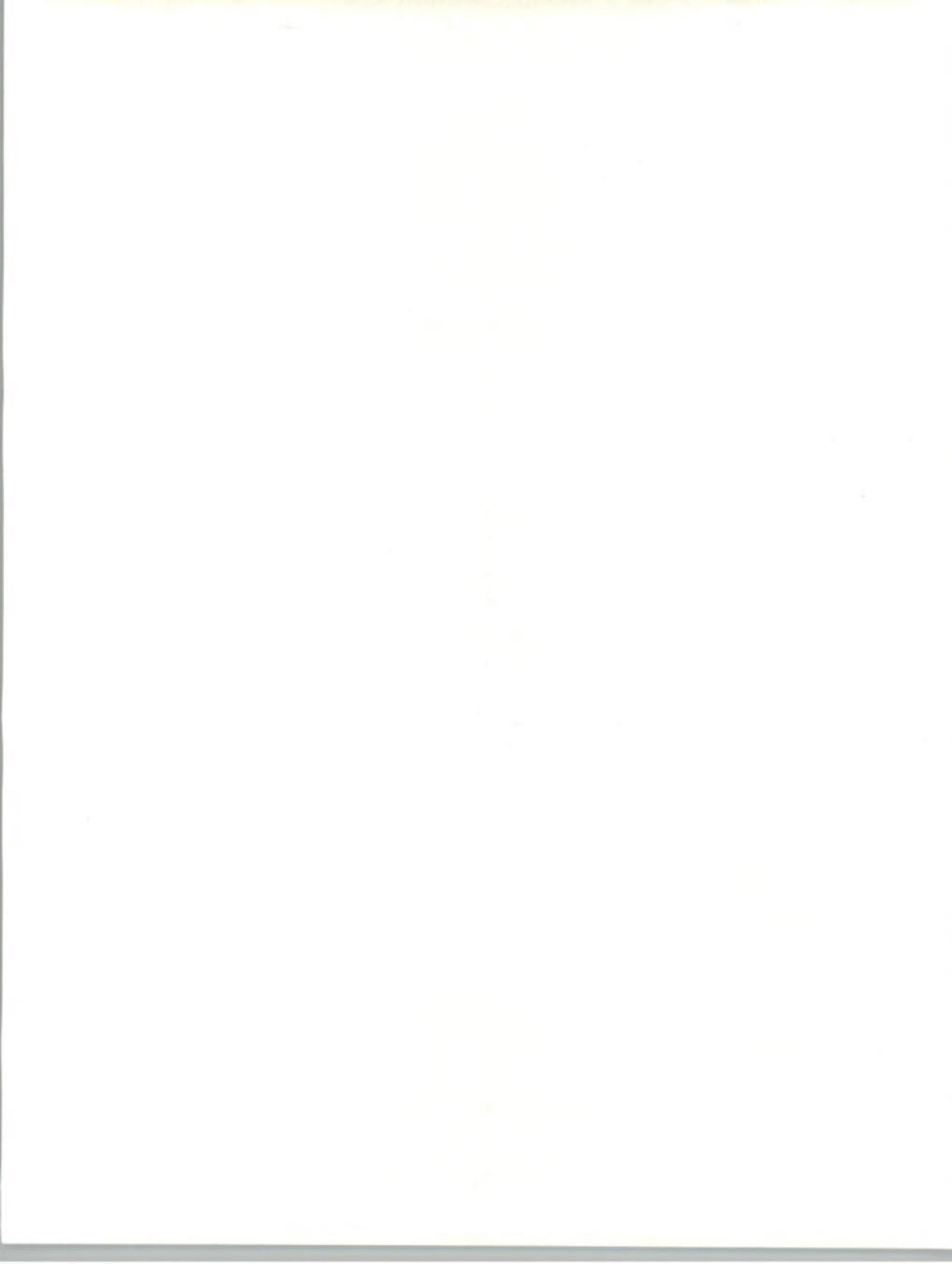
Market Analysis
Program (MAP)

**Industry Sector
Markets
1988-1993**

State and Local
Government
Sector

INPUT®

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D E C E M B E R 1 9 8 8

INDUSTRY SECTOR MARKETS 1988-1993

STATE AND LOCAL GOVERNMENT SECTOR



Published by
INPUT
1280 Villa Street
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**Market Analysis Program
(MAP)**

***Industry Sector Markets, 1988-1993
State and Local Government Sector***

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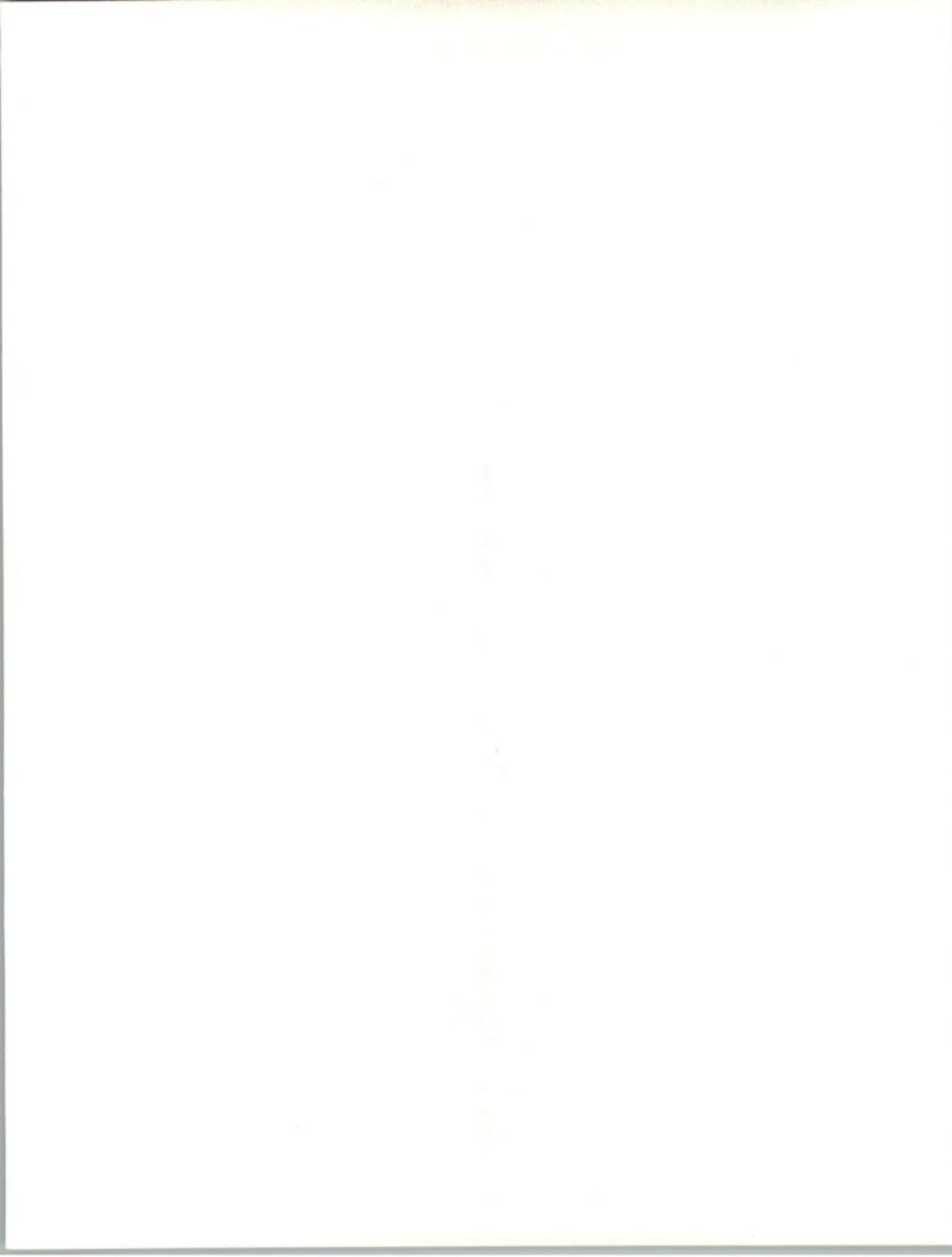
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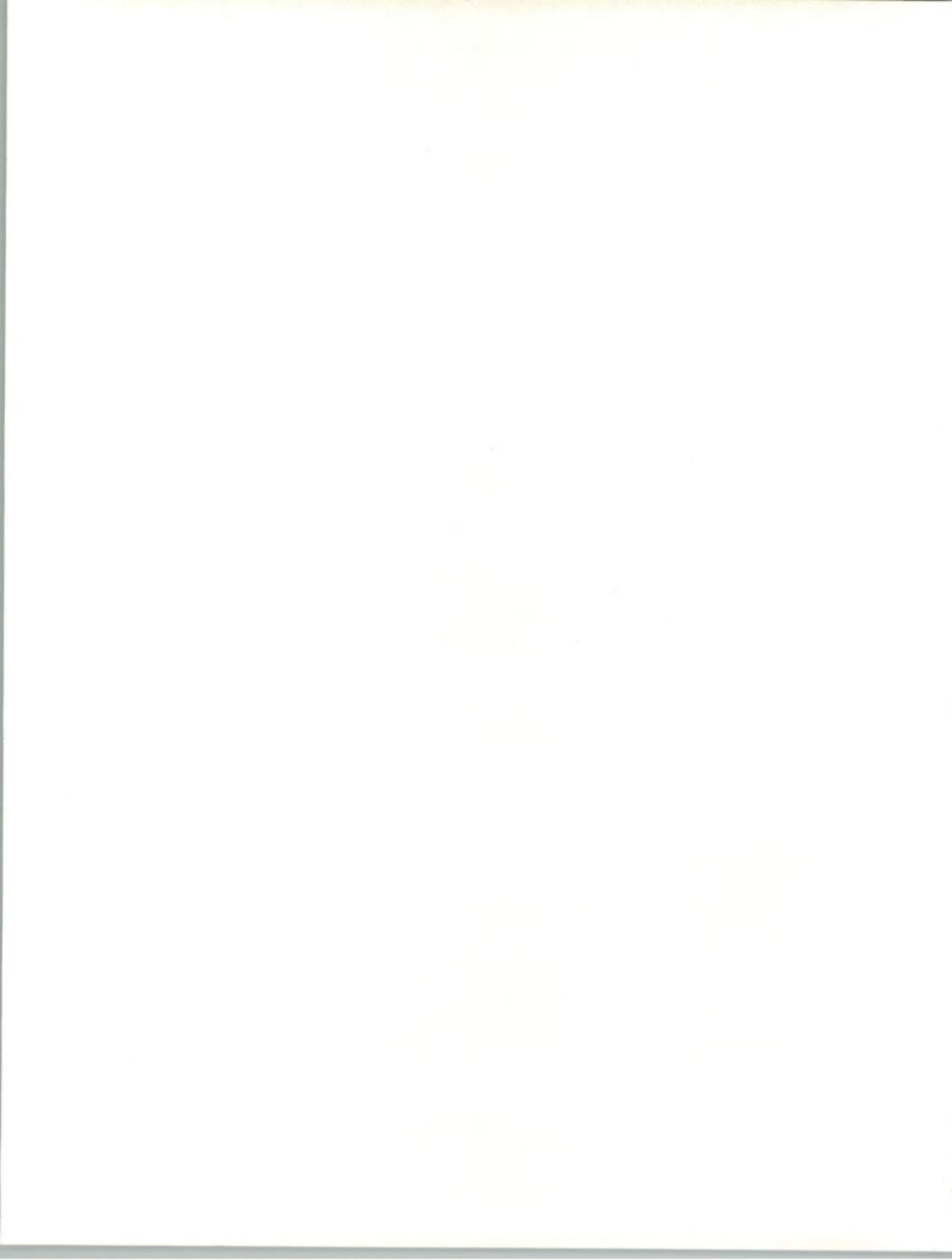
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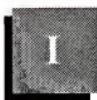
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SL-B

**-1 State and Local Government Sector User
Expenditure Forecast by Delivery Mode,
1988-1993**

III-SL-45





Introduction

A

Overview

This report on the state and local government sector is provided as part of INPUT's broader coverage of the information services industry.

INPUT's analytical approach to the information services industry includes a subdivision into seven basic delivery modes, as indicated in Exhibit I-1, and fifteen industry-specific sectors and seven cross-industry sectors, as defined by the first two digits of the Standard Industrial Classification (SIC) codes.

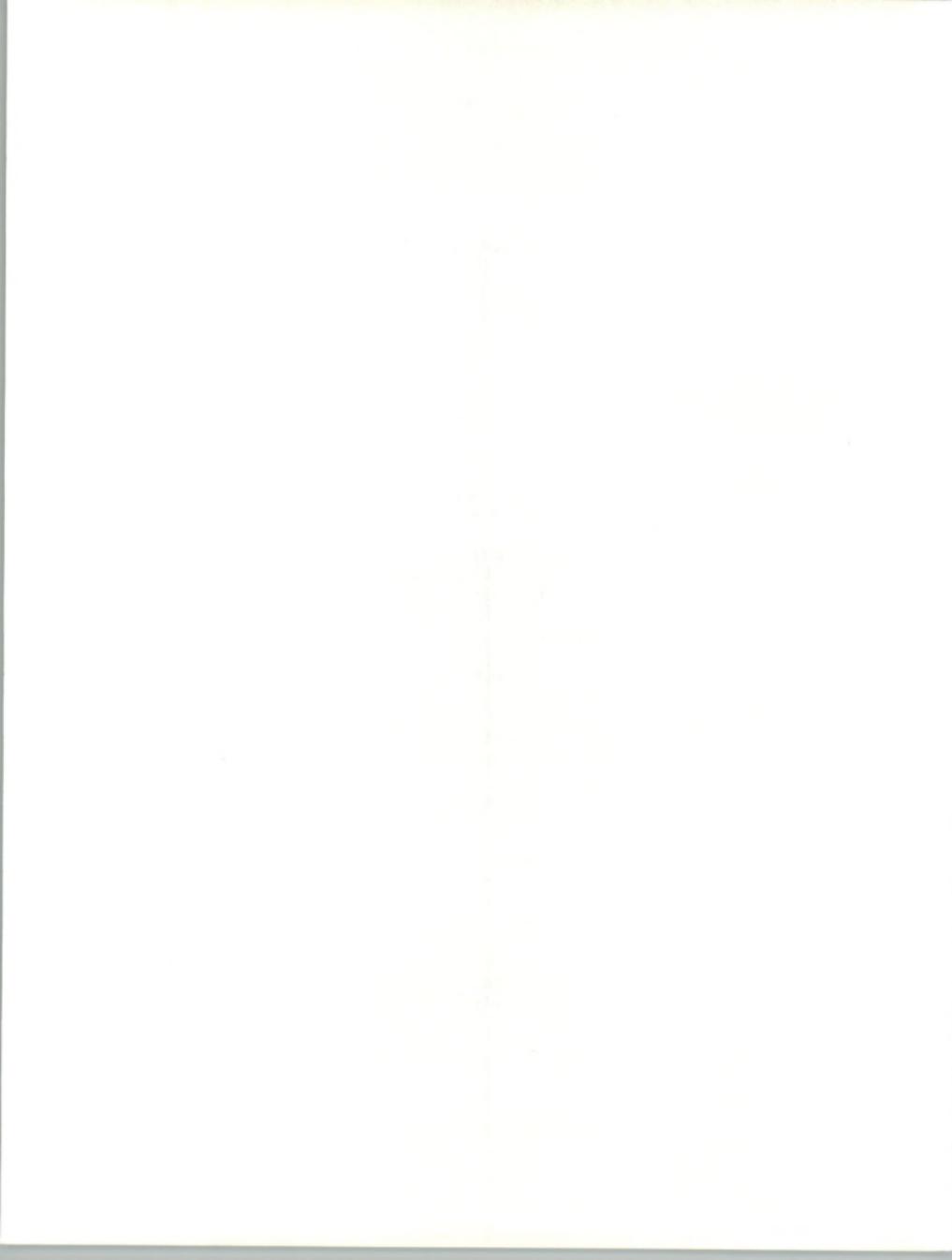
The state and local government sector, as well as the competitive and user activities described in Chapters III and IV, was analyzed by utilizing material from the surveys conducted for the INPUT *ISP Planning Report* and CAMS data base, surveys of over 20 vendor organizations engaged in systems integration activities in this sector, and 20 additional interviews with information systems (IS) managers, officials, and vendors who work in the sector. This material was utilized, together with the INPUT data base and files, to prepare the forecast in Chapter II.

Vendor revenues and market size data have been rounded according to the following conventions:

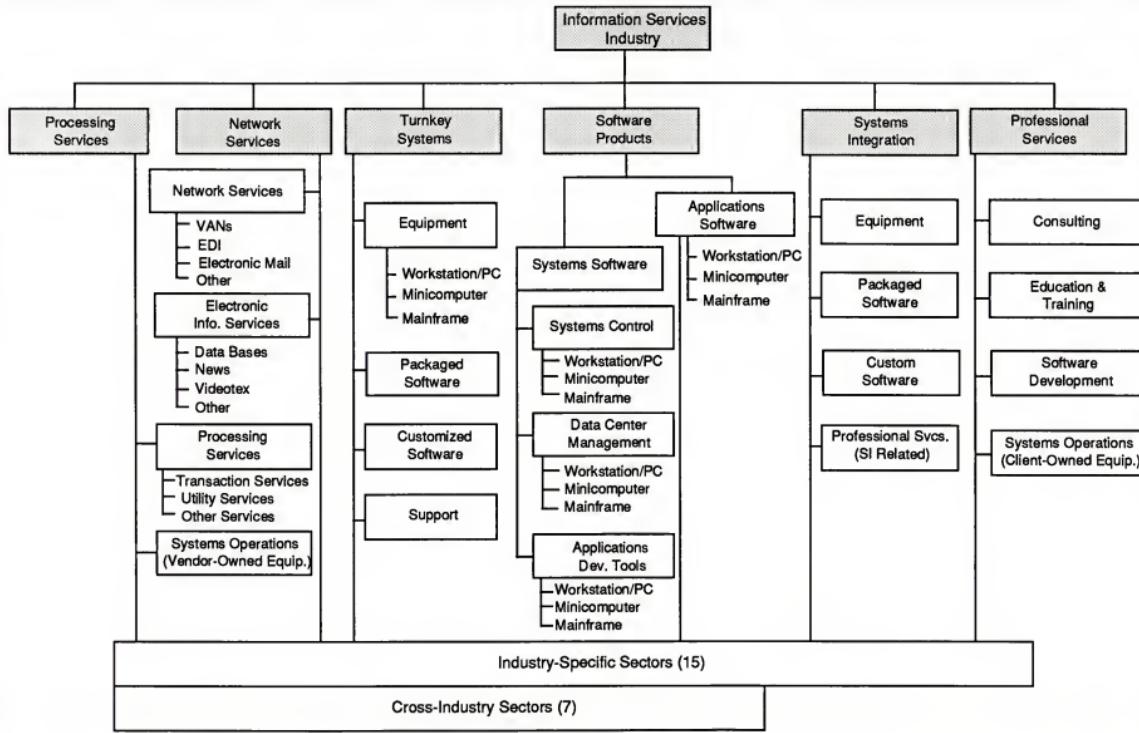
1. Data stated in millions, XXX (N.0, N.5)
2. Data stated in billions, X.X (N.N)

Frequently used acronyms and other technical terminology used in this report and related to the information services industry and the industry-specific state and local government sectors include:

- *Compound Annual Growth Rate (CAGR)*



INFORMATION SERVICES INDUSTRY STRUCTURE 1988





- *Information Systems (IS)* - Hardware and software systems and related services required to acquire, manipulate, store, move, have access to, and report large amounts of data in a meaningful way to users.

These programs include the traditional data processing and telecommunications services required to satisfy corporate informational needs.

- *Information Services* - The term used to describe the software and software services industry (vendor revenues) and markets (and user expenditures).

B**Environment**

The environmental picture that emerges from the analysis provides in-depth understanding of the opportunities and challenges of the sector.

There are over 200,000 equipment sites in the state and local government sector, with a wide range of information system use—from archaic, older equipment or early PCs in small municipality, township, and county offices, to sophisticated, on-line, mainframe, and supercomputer systems using advanced systems and software in large city, state, and agency offices.

- Many offices in this sector require more aid in using new technology than offices in the federal government or commercial sector.
- The use of remote processing to meet user needs has been an escape hatch for sudden demands for new applications. As in-house use of information systems has increased to reduce or avoid processing cost, offices in this sector have sought the aid of professional service firms or systems integrators in using new technology.

Most of the organizations in the sector have experienced and will continue to experience budget limitations.

- At the same time that there is increasing pressure to reduce taxes and government costs, there are demands for new systems, particularly on-line systems, to improve social services, upgrade accounting and financial applications, control funds, collect information, and meet needs in criminal justice, court operation, and other areas. A list of application areas appears in Appendix A.
- The growth of demand for services that will require the use of information systems has been outpacing the development of facilities in this sector. This is partially due to the fact that, in general, most governmental offices in the sector do not obtain sufficient funds to develop a plan to meet more than present or near-term needs.



Government officers and executives must meet public demands for new or improved services or budget reductions with commitments—commitments, affected by political pressures and the aspirations of officials, that will require fast response from information systems. However, IS departments are kept on tight budgets.

- Many of the IS staff members who are protected by civil service positions become cynical about their management and government officials, as well as the use of information service vendors to aid with or meet new commitments.
- Methods have to be found to improve and reward IS staff members, as well as to upgrade in-house capabilities to meet new commitments.

A wide range of software applications has been developed to meet the needs of the sector by hardware vendors such as IBM, Unisys, and Wang (which is particularly strong in this sector); by a number of software vendors, including AMS and CAI; and by Big Eight firms, such as Arthur Andersen and Ernst & Whinney. Professional service firms, such as CSC, OAO, and Arthur D. Little have also been supporting the needs of the sector.

A number of information service vendors have learned to deal with the needs, politics, divided management responsibilities, methods of funding and budgeting, and staff problems that can be encountered in the sector. However, some vendors have lost contracts after they were supposedly awarded, or found that expected funds or cooperation were not available. Marketing to this sector requires analysis of the factors involved in each sales situation.

C

Industry Trends

During the last few years, there has been a notable increase in commitments that require new IS capabilities; information services, particularly professional services and systems integration, will grow rapidly during the next five years as a result.

- Vendors that are established in the sector, such as IBM, Wang, and SCT, are participating in this growth.
- Information service vendors that have entered the sector recently (or had small revenue from the sector previously), such as SHL Systemhouse, Federal Engineering, and BCS, are growing rapidly as well. Communication firms are also responding to this situation, reflecting the fact that many of the new system needs involve communication capabilities.

The recent surge in programs and commitments in this sector has also increased demand for upgraded financial systems to improve and track budgeting procedures, financial reporting, and planning.

- Big Eight firms have become increasingly active in the sector.
- The use of PCs and spreadsheet programs has mushroomed during the past few years.
- Small firms with expertise in financial applications and modeling for PCs, such as Desktop Financial and PM Software, report considerable growth in activity.

The value of information resources has become more apparent. Many offices in the sector are exploring or expanding use of data management technology, including relational systems.

The need to upgrade or establish in-house capabilities to run new systems has resulted in contracts to information service firms to develop networks, build centers, install data base management systems (DBMS), develop office automation systems, and conduct planning studies.

D

Driving Forces

The need for new IS managers, programs, and services is a foremost driving force in this sector, as shown in Exhibit I-2. States and cities have indicated that new on-line systems are required to provide faster and better response to human resource/social service, traffic, financial control, tax, assessing, law enforcement, and other needs.

EXHIBIT I-2

STATE AND LOCAL GOVERNMENT DRIVING FORCES

- Need for New Programs and Services
- More Reliance on Information Systems Management
- Budget Pressures
- Expanding Wealth of Powerful Technology
- Changes in IS Organization/Direction

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The fact that so many of the commitments being made in this sector require the use of information systems capabilities indicates that the "increased reliance on IS" is a second driving force in this sector.

- In addition to major programs, officials and executives in the sector are demanding more ability to make inquiries, manipulate stored data, and communicate between offices.
- Increasingly, information service vendors are being consulted for means of responding to commitments and applying new IS technology.

The "expanding wealth of powerful technology," another driving force in this sector, is one reason the knowledge of information service vendors is being sought. The use of more recent technology, such as networks, relational data management, voice response, CD ROM, supercomputers, and CASE, is viewed as important to meet service commitments. However, in general, organizations in this sector have not had the budgets or opportunities to gain sufficient knowledge about new technology. This has resulted in the increasing utilization of third-party professional services/systems integration companies to implement these technologies:

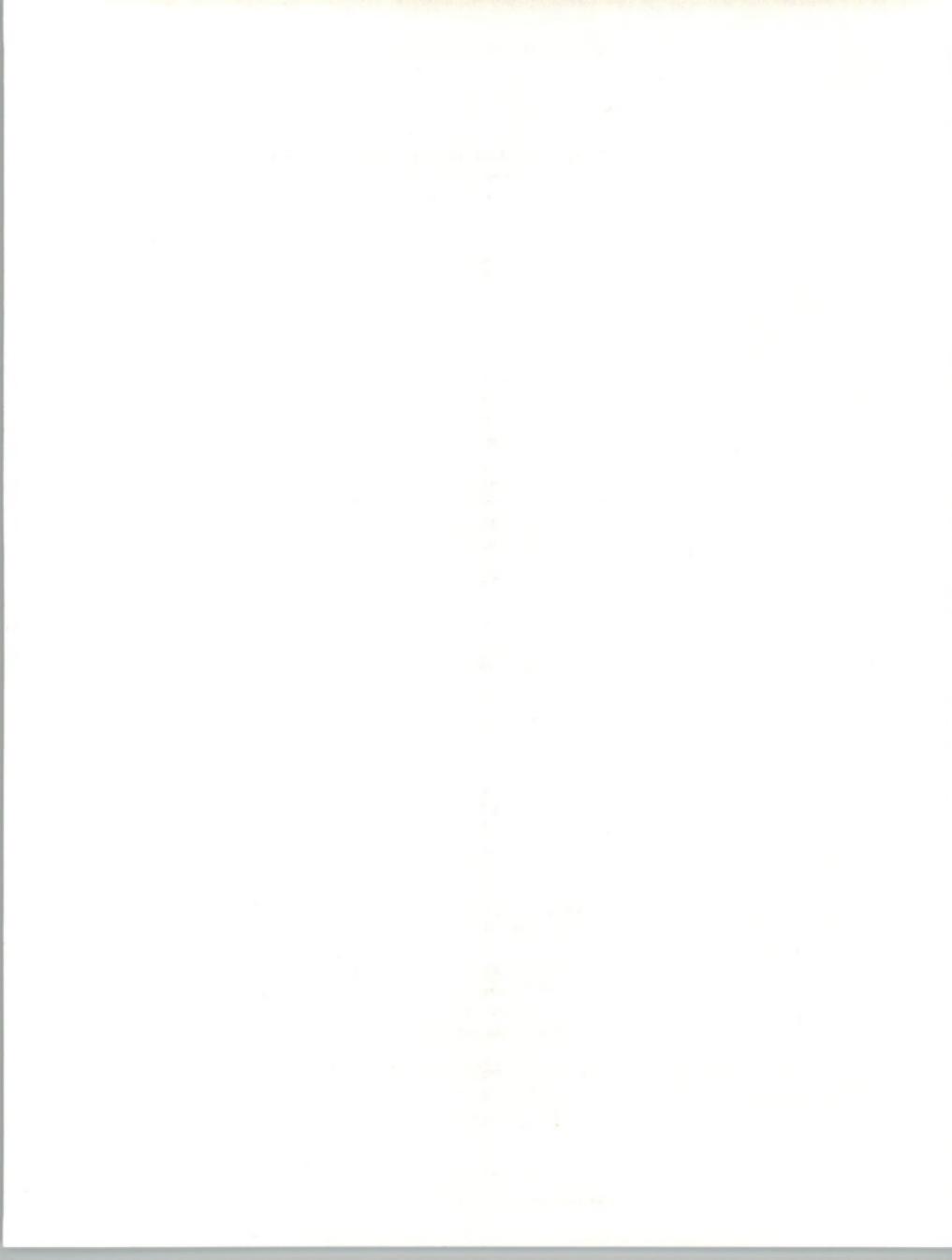
- DMR has just concluded a contract with the state of Massachusetts to provide a development methodology on a statewide basis to state agencies, municipalities, and towns.
- Boeing Computer Services is developing network capabilities in several states.

However, "budget pressures" also remain a driving force in the sector and can inhibit or complicate the growth of IS in many situations.

- One IS executive in a state authority noted that the budget situation forced him to continually train new recruits to use DBMS and 4GL capabilities and then watch them leave to get jobs elsewhere within a few years, since his budget could not pay higher salaries for such personnel.
- The pressure of large backlogs of maintenance and development work is also a result of budget problems.

The budget pressures, backlogs, and demands in this sector have resulted in the support of activities by a group of offices which can be run separately from IS departments. Also, advisory groups have exerted influence in many offices in this sector.

Changes in "IS organization/direction" has also become a driving force in this sector as well as in other sectors. In many cases the direction of change is unclear, resulting in disparate programs.



Information service vendors have commented that when making bids in this sector, it is necessary to assess the organizational structure that will be involved in making decisions and participating in the programs.

E**Major Issues and Inhibiting Factors for Vendors**

Based on information gathered from information service vendors, user executives, and IS managers in this sector, five major issues facing vendors were identified. These are listed in Exhibit I-3.

EXHIBIT I-3**ISSUES FOR INFORMATION SERVICE VENDORS**

- Successful Use of Information Service Products
- Connectivity
- Data Management
- Assessing User, IS, and Executive Roles
- Planning Services for the Public Sector

- Support for products to ensure their successful use.
 - One user executive remarked that user needs go beyond standard user-friendly software: allowance has to be made for the use of complex systems by officials with no experience, as well as by users or IS staff members who have not been given proper training. According to this executive, it might be necessary for the system to have demonstrations of use available as an option or menu choice or to have a fallback option to very simple use of the system (that might be very slow) like a beginner's trail in skiing.
 - Other users and information service vendor representatives noted the need for special training or review during projects or for IS management visits to other states or cities to examine systems that could apply to their own operation.



- A rapidly growing need for "connectivity", such as the linking of multiple government department applications or terminals. The need for connectivity in this sector has led many organizations to seek aid from new vendors.
- "Data management"—There is an increasing need to access and analyze accounting and financial data, as well as data used in human resource/social service and other applications.
 - Information service vendors, including IBM, Unisys, and Oracle, are using their data management (as well as connectivity) capabilities as an entry vehicle for selling other products in the sector.
- Users and vendors report that many projects required significant data management (and software integration) expertise and that vendors must be prepared.
- The assessment of what role to play by users, officials, and IS management.
 - For some new projects, it has been reported that a group of users and officials may be involved. In other cases, IS managers and/or external advisors may be involved.
 - Projects may be approved and authorized by one group and then handed to another group for development.
 - Questions of organizational responsibility can be an inhibiting factor in making decisions.

In order to control costs and ensure the success of projects, vendors must try to assess what roles will be taken and what aid or training will be required as projects proceed.

The opportunities and challenges of this sector require that vendors carefully plan their strategies and offerings for the sector.

- Some vendors have spent considerable time in the sector in developing a set of good application products or in providing services in one professional service segment but have not responded to the larger opportunities emerging in professional services or systems integration.
- There are also rapidly growing needs for aid with networks, connectivity, data management, office automation, and upgrading hardware systems—needs which some vendors seem to be neglecting.



Considerable backlogs of work can be an inhibiting factor in persuading IS managers and users to proceed with a project.

There is a need and opportunity for information services and other vendors to take a consultative selling approach in this sector, proposing solutions that meet new commitments or aid with backlogs to government officials before bids are solicited. The ability to influence the creation of a "request for proposal" places any vendor in a strong position.

F**Major Issues for Information Systems (IS) Managers**

Based on information gathered from organizations in this sector and information service firms offering products to them, the major issues affecting IS departments in the sector were identified in Exhibit I-4. The factors IS vendors should consider for success, in view of these issues, are analyzed in this section.

EXHIBIT I-4**ISSUES FOR IS DEPARTMENTS**

- Rising Expectations of Key Users and Officials
- User Demands for More Complex Solutions
- Planning for Changes in Technology
- Productivity and Backlogs
- Integration of Data/Technology Applications
- Budgeting and Funding

The first major issue to consider is "the rising expectations of key users and officials." Officials and executives in this sector expect to fulfill commitments through the use of information technology.

- In order for IS management to be perceived as contributing to organization goals, it is necessary for it to participate in activities involved with solutions to these commitments, even if other pressures or a backlog of work make it difficult to respond.



Figure 1. Dendrite–dendrite coupling in the hippocampus. **A**, **B**, **C**, **D**, Electron micrographs of hippocampal neurons. The electron-dense vesicles in the dendrites are the markers for the coupling sites. The electron-dense vesicles in the dendrites are the markers for the coupling sites. The electron-dense vesicles in the dendrites are the markers for the coupling sites. The electron-dense vesicles in the dendrites are the markers for the coupling sites.

coupling sites in the hippocampus and the cerebellum.

Because the electron-dense vesicles are the markers for the coupling sites, we can use the electron-dense vesicles to identify the coupling sites in the hippocampus and the cerebellum.

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- The backlog of work with which IS is struggling could become a reason for bypassing IS management in the review of, and action on, new commitments. Internal resources available to complete this backlog of work is also limited.

Vendors supplying services to IS must keep track of meetings and activities of organization executives and officials that IS has not participated in and that could result in decisions for new projects.

The second issue for IS management to consider is the "demand from users for more complex systems."

- Key users and officials have been demanding on-line, integrated systems for human resource/social service, tax, court, criminal justice, public safety, real estate, and other systems to replace batch systems, as well as systems run at processing centers.
- There are also demands for reports that provide access to or combine more data and require data management capabilities.

In order to meet the demands, IS must participate with management to determine priorities, demands that can be met together with other commitments on the table, and the willingness to use outside resources. In order to be successful, information service vendors should stay aware of user demands and commitments and encourage IS departments either to go to operations management or to work directly with management in circumstances where action is likely.

An issue that IS management must respond to is "planning for changes in technology."

- IS managers in this sector report that, in some instances, planning may involve managing the technical investment; in other cases, it may involve deciding how new technology can be employed in a separate installation or with a vendor's aid if the IS installation cannot be upgraded rapidly enough to meet needs.

"Productivity and the backlog" remains a major issue of IS management in this sector. IS management must seek aid from management in assessing priorities and, if possible, must encourage the use of outside resources to obtain relief.

- It may be necessary to explore the use of inquiry and report generation capabilities and PC packages by users. However, having users in this sector become involved in development may be difficult because they tend to be concerned about doing work that is outside of their civil service job title and scope.



- A number of IS departments are exploring the use of 4GL and CASE to obtain relief. These capabilities may aid in the future, but the required investment in training and learning may exacerbate problems in the near term. Interaction with management on priorities and resources and on the exploration of application packages to meet needs is also necessary.

Although the need for "integration of data/technology/applications" is not as strongly recognized, it is an issue in this sector. One vendor noted that it is submerged in many cases by the demand to install totally new application systems and convert data to new DBMS.

- In some cases, new needs could be met through integration of data/technology/applications and upgrades of certain application segments, rather than through development of a completely new system.
- IS management and vendors must be alert to opportunities to meet needs through integration, particularly for needs in the backlog queue.

G

Major Issues for End Users

Information from end users, IS managers, and vendors was used to develop the list of issues for users, shown in Exhibit I-5. Vendors should consider these issues in planning their objectives for success.

EXHIBIT I-5

ISSUES FOR END USERS

- Role in Systems Activities
- How to Obtain Sufficient IS Support
- Connectivity
- Data Management
- Training for Use of IS

The user "role in system activities" is a major issue due to the increasing complexity of demands for service and the backlog that confronts IS. Users must become involved in developing requirements and in development activities in the future although civil service titles may prove to be

an inhibiting factor. Some users have started to use 4GLs and PCs to meet system needs, according to IS managers and users in the sector. Vendors should anticipate more participation by users in evaluating, selecting, and installing their products.

An issue that is apparent to some users is the need to obtain support or training from IS or from vendors to help them specify requirements, as well as to help them use application systems more effectively. IS management and the involved information service vendors must seek resources to adequately train or support users.

“Connectivity” is a major issue for end users in this sector since there are many needs that involve access by mayoralty, city controller, budget, or state offices to financial, human resource, real estate, planning, or other data bases. Local, regional, and statewide networks are now being sought for many projects. There is an increasing need for vendors serving this sector to have network expertise.

The need to deal with and improve access to many data bases makes “data management” a major issue for end users as well. Some users, as well as IS managers, are now exploring relational technology. Vendors must be prepared to help aid in the upgrade of data management capabilities.

The pressing issues that face users in this sector are making it mandatory for them to consider increasing “training for the use of IS.” Means of addressing the issue of training are being considered at all levels of state and local government, and vendors interested in this sector should explore services or presentations that could meet this need in order to build relationships and to scope the needs of prospects for information services.

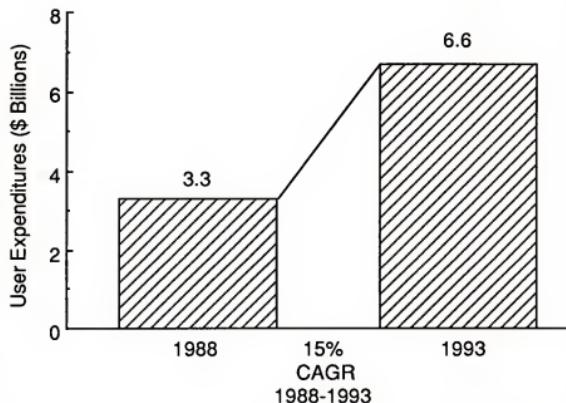


II

Market Forecast

INPUT forecasts that user expenditures for outside vertically-oriented state and local government information services will amount to \$3.3 billion in 1988, as shown in Exhibit II-1. The rate of increase from the comparable 1987 figure for total services of \$2.8 billion is 18%.

EXHIBIT II-1

**STATE AND LOCAL GOVERNMENT SECTOR,
1988-1993**



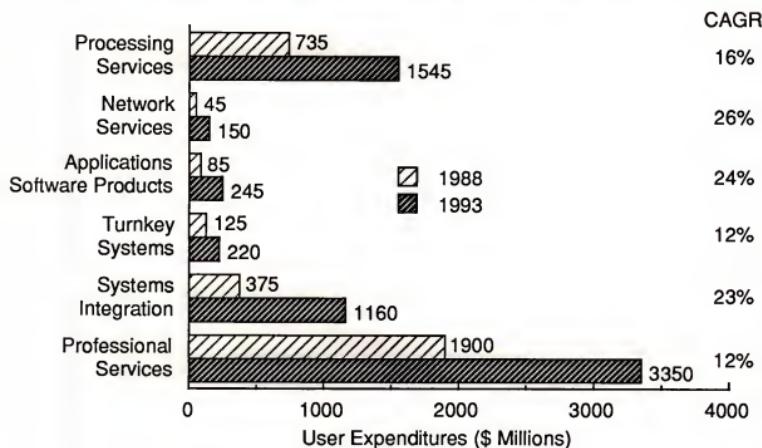
The 15% growth rate expectation during 1988-1993 for the state and local government sector reflects the following factors:

- The implementation of on-line information systems, in particular, has lagged the commercial and industrial sectors.
- State and local government agencies are increasingly being run as "business enterprises", with accountability for productivity and general efficiencies of operation.

More details on growth are shown in Exhibits II-2 and II-3 and in Appendix B.

EXHIBIT II-2

**STATE AND LOCAL GOVERNMENT SECTOR
FORECAST BY DELIVERY MODE, 1988-1993***

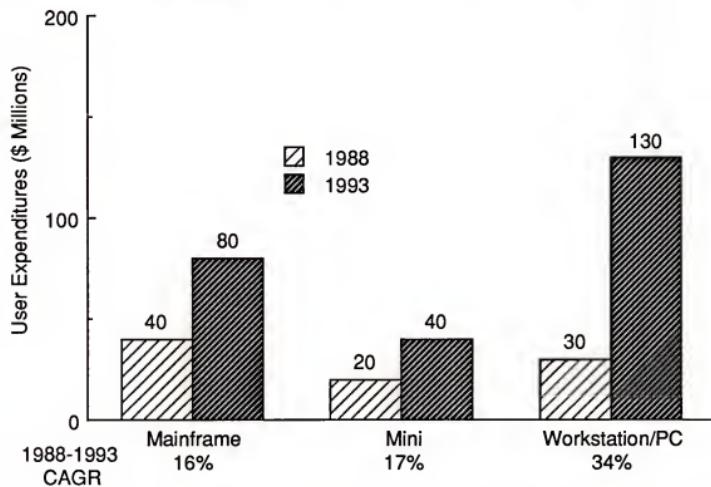


* Rounding of data may result in a discrepancy between dollar value shown and actual CAGR



EXHIBIT II-3

**STATE AND LOCAL GOVERNMENT
INDUSTRY-SPECIFIC APPLICATION SOFTWARE
FORECAST, BY HARDWARE PLATFORM**



- Processing services will continue to be one of the largest delivery modes over the next five years, but will grow at a slower rate (16%) than other delivery modes as some users turn to other forms of delivery. This movement or conversion of processing services to in-house operations to reduce costs has lagged behind the federal government and commercial sectors. This is due in part to the fact that state and local governments oftentimes cannot offer IS salaries competitive with the commercial sector to attract qualified personnel.

The largest component of processing is system operations (facilities management). Systems operations will grow at a CAGR of 16% during the next five years to a total of \$1.2 billion of expenditures in 1993, illustrating the tendency of organizations in this sector to seek vendor assistance.

As Exhibit II-3 indicates, the application software growth will be higher for workstation/PC products (34% CAGR versus 17% for minis and 16% for mainframes). This will enable the total volume of sales of application software for workstation/PCs to exceed \$100 million in 1993, surpassing expenditures for mainframe application software products.

As an IS vendor noted, most of the organizations in this sector are interested in strong vendor assistance with technology as well as in developing functional requirements. This helps to explain the rapid projected growth and size of professional services and systems integration in this sector.

Systems integration is a mode for obtaining aid from vendors that is sought mostly by larger government offices in this sector. Professional services are utilized by large and midsized offices more than smaller ones. Turnkey systems are used more in smaller and midsized organizations.

User expenditures for network services will grow at a high CAGR of 26% to a level of \$150 million by 1993, fueled by a growth of value-added network use.

The second highest projected growth rate (23%) for the state and local government sector is for systems integration user expenditures. This relates to the need to implement newer IS technologies, oftentimes provided by multiple vendors under a primary systems integrator, and the lack of required in-house capability in many state and local governments' IS departments.



Competitive Developments

A

Market Characteristics

The use of information services vendors in the state and local government sector is undergoing dramatic change, and new vendors are gaining significant market share.

In a fashion similar to the federal government, this sector has relied strongly on information vendor services to meet demands for services. In many cases, it has been necessary to use vendor services because the budgets for internal information system (IS) resources have not been large enough to develop resources that could address new situations. In other cases, vendors have been used because they can respond much faster than IS or because IS has been bogged down with a backlog of maintenance/enhancement work.

To meet the needs of the sector, many vendors who served the federal government offered their services to the state and local government sector.

- EDS, American Management Systems (AMS), and Lockheed supply processing services.
- IBM, AMS, and Wang supply application software products.
- CSC, OAO Corporation, and Arthur D. Little offer professional services.

The state and local government sector has been similar to the federal government sector in its reliance on large processing and professional service vendors, such as EDS and CSC. The sector tends to lag the federal government in many trends such as the use of PCs and systems integration, but its use of processing has continued to grow at a high rate while use in the federal sector is growing much more slowly.

Processing has been a major mode of vendor service up to the present time, although many organizations have started to move work in-house as the relative cost of processing grows.

- Processing vendors such as General Instrument have served this need by supplying software products or turnkey systems.
- Since there is a high need for customized applications in this market, many professional service firms that helped the federal government move work in-house have entered this sector.

Despite the needs in state and local government, many information service firms have found it difficult to complete for business in the sector or perform projects since the roles of officials, executives, advisory groups, and IS managers are not always clear and some decisions seem arbitrary or political. Leading vendors in the sector have developed marketing programs in key accounts to overcome these problems.

A sudden surge in demand for more complex systems in states, large cities, and authorities, has recently interrupted the pattern of growth prevailing since the 1980 time period. Demands for on-line systems serving a city- or state-wide need, such as unemployment, medical claims, financial data gathering, and criminal justice needs, or for network development, have resulted in projects that cannot be managed with present IS organizations or user support groups.

In order to participate in planning for these complex projects, many IS executives have to be extracted from the pressure of their budgets and large backlogs.

To meet these new, large demands, government officials or executives have had to participate more in selecting the resources to be used and arranging for the funding and user groups that will participate.

Newer suppliers, such as SHL Systemhouse and Bell Atlantic, have begun to enter this sector with systems integration (SI) services to meet these needs. NYNEX and its recent acquisition, AGS, have just entered the sector by obtaining an SI contract with New York City government. Most of these vendors have experience with this type of project in the federal and/or commercial sectors.

Increased needs to manage and manipulate financial and other data have also started to grow more rapidly during the last few years. Many new vendors of data management, inquiry and decision support software, and professional services are being consulted.

Key applications/technologies identified by vendors with revenues from this sector, ranked in Exhibit III-1, include upgrades to general capabilities to meet recent demands as well as specific application areas.

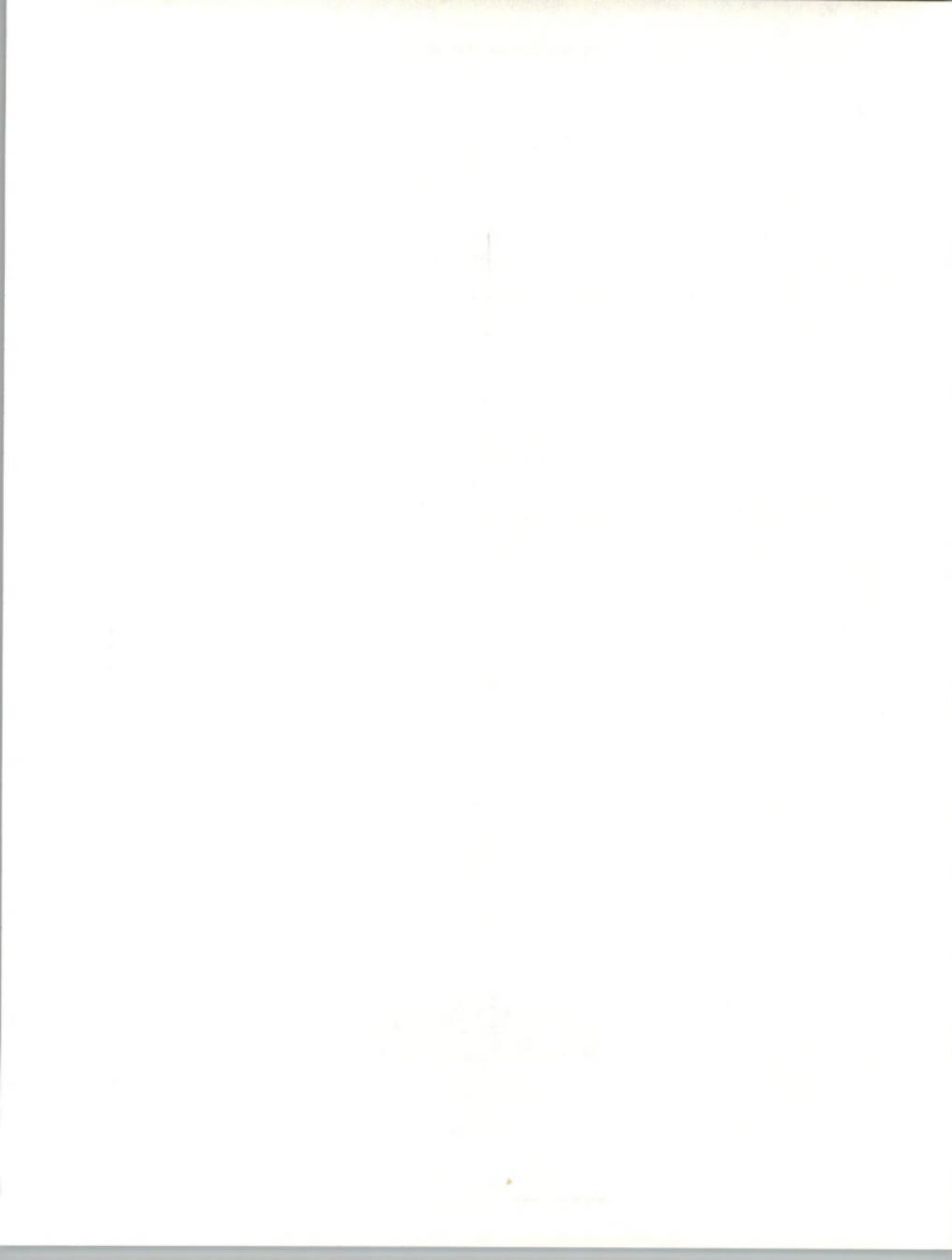


EXHIBIT III-1

KEY APPLICATIONS/TECHNOLOGIES

Application/Technology	Relative Importance among Respondents (Where 5 = High and 1 = Low)
Network Planning and Implementation	4.2
Human Resource Applications	3.9
Data Base Systems and Data Analysis Software	3.8
On-line Claims and Eligibility Processing	3.6
Computer-Aided Dispatching	3.1
Upgraded and New Financial Management, Budgeting, and Reporting, Including Financial Analysis and DSS Capabilities	3.3
Criminal Justice and Court Applications	2.8
Upgraded Office and Administrative Support, Including Imaging Systems	2.5
Upgraded Hardware and Systems Software Capabilities of Installed Systems	2.4

Network planning and implementation ranks highest as a key application since most of the recent demand for systems requires statewide or regional capabilities. Vendors with network experience such as Boeing, SHL Systemhouse, Unisys, and Bell operating companies are responding to this need.



Information service vendors also report implementing data bases, upgrading hardware and system software at data centers, and upgrading office and administrative support capabilities as key applications.

- Vendors are selling and implementing these capabilities at offices of states and large cities apart from any specific application projects in many instances.
- Upgrades or new capabilities are generally obtained as part of an application project at smaller offices of this sector.

In general, human resource applications stand out as a key application area. A number of vendors have contracts to implement large systems or install software applications in this category. Public interest in human resource applications such as welfare, food stamps, and aid to addicts have driven activity in this segment.

On-line claims and eligibility processing ranks as a key application area due to a group of large professional service and SI contracts in this market. Interest in this application has mounted as a result of budget pressures in this sector and the increased desire to limit fraud and to provide better service through the use of on-line capabilities.

Computer-aided dispatching is another application that has mounted in interest, since on-line systems can provide visible increases in service and faster response to emergencies.

Upgraded and new financial management, reporting, and budgeting systems continue to be key applications in state and local governments.

- There is a need for more uniformity in financial and accounting practices and procedures in these systems.
- Needs have grown for inquiry, financial modeling, spreadsheet, and decision support software that can be used in conjunction with financial and budgeting software.
- On-line access to data and connectivity are also being demanded for these applications.

Criminal justice and court systems have continued to be key applications. There is also need for the use of on-line capabilities and connectivity in these applications.

Among the many other applications that are highlighted by vendors in this sector, improved or new tax systems was noted as another significant application. A few vendors also mentioned lottery systems as an area of interest.



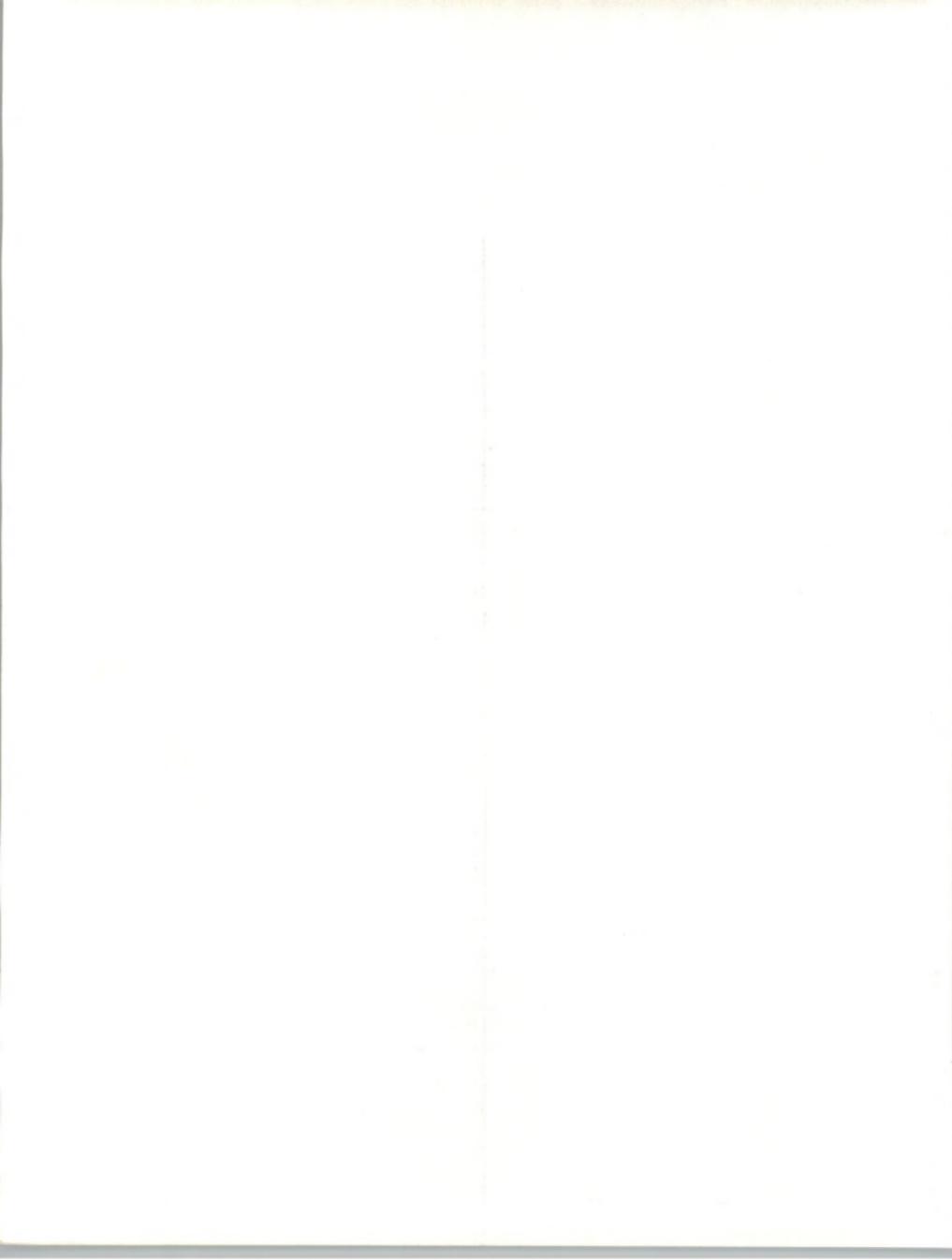
B**Leading and Emerging Vendors**

Leading information service vendors serving state and local government organizations in 1987 included EDS, GTECH, Wang, Arthur D. Little, IBM, and Business Records Corp., as shown in Exhibit III-2.

EXHIBIT III-2
STATE AND LOCAL GOVERNMENT—SELECTED VENDOR SHARES—INDUSTRY INFORMATION SERVICES, 1987

Vendor Name	(\$ Millions)							(% Total Market Share)
	Processing Services	Network Services	Turnkey Systems	Application Software Products	Systems Integration	Professional Services	Total	
• EDS	95						95	3
• GTECH	81						81	3
• A.D. Little							43	2
• IBM				30	5	5	40	1
• Business Records Corp.				18			35	1
• CSC		20					27	1
• Consultec	20				2	9	25	1
• SCT				5		10	22	1
• AMS	3				9	9	21	1
• Lockheed	19						19	1
• SHL Systemhouse					17		17	1
• MSA (& IA)							15	1
• Atek				15			13	1
• Boeing			8	5		12	12	<1
• Gen'l Inst						5	12	<1
• OAO	7		5			7	12	<1

None of the more recent or emerging vendors has revenue levels as high as these well-established vendors, although several emerging vendors in the sector, such as SHL Systemhouse, have had rapid growth during the past few years. In addition to systems integration contracts for claims eligibility, office systems, criminal justice, and other applications, SHL Systemhouse has just won a contract with Unisys for a lottery system in Florida.



Most of the vendors with high revenue (EDS, GTECH, Wang, and Arthur D. Little) offer processing or professional services and offer them to the federal government as well as this sector.

There are more vendors offering application software products in this sector than any other mode of service, but only a small number, including IBM, Wang, Business Records, AMS, and Consultec, have substantial revenues from the sector.

- Some vendors with a presence in application software or professional services, such as Arthur Andersen, Unisys, and Boeing, have substantially increased their revenue from the sector by supplying systems integration services.
- Not all of the vendors who have had earnings from the sector over the last decade have started to exploit systems integration opportunities. IBM and Boeing are notable exceptions.

Vendors that have used their knowledge of systems integration to move into the sector and grow revenue from this mode of service include SHL Systemhouse, Federal Engineering, and OAO.

Some software application vendors that have sold four or more packages in this sector, such as PM, Moore Governmental Systems, Florida Computer, Gemunis, Mentor Systems, and Mid American Control, have not taken advantage of systems integration or professional service bids. Most of these vendors may feel that their size is too small to respond to large bids. They could, however, make use of their knowledge in joint bids with other companies.

Some vendors are responding to the special needs of the sector, in addition to or instead of responding to generalized applications needs.

- Boeing Computer Services has responded chiefly to network and connectivity needs.
- Unisys has responded to connectivity and data management requirements, and Federal Engineering has responded to network as well as certain application needs.
- PM Software offers PC application packages, chiefly to meet the fast-growing use of PCs in smaller organizations.

Vendors have not demonstrated a tendency to offer services across a number of submodes in the sector or to have expertise in a variety of application areas.



- Only a few vendors, including IBM, CSC, and AMS, offer more than two modes of service.

Some information service vendors such as SCT and Keystone Computing, do offer services to educational institutions in conjunction with services to state and local government organizations. In many cases, contacts in one of these markets can aid with contacts in the other.





IV

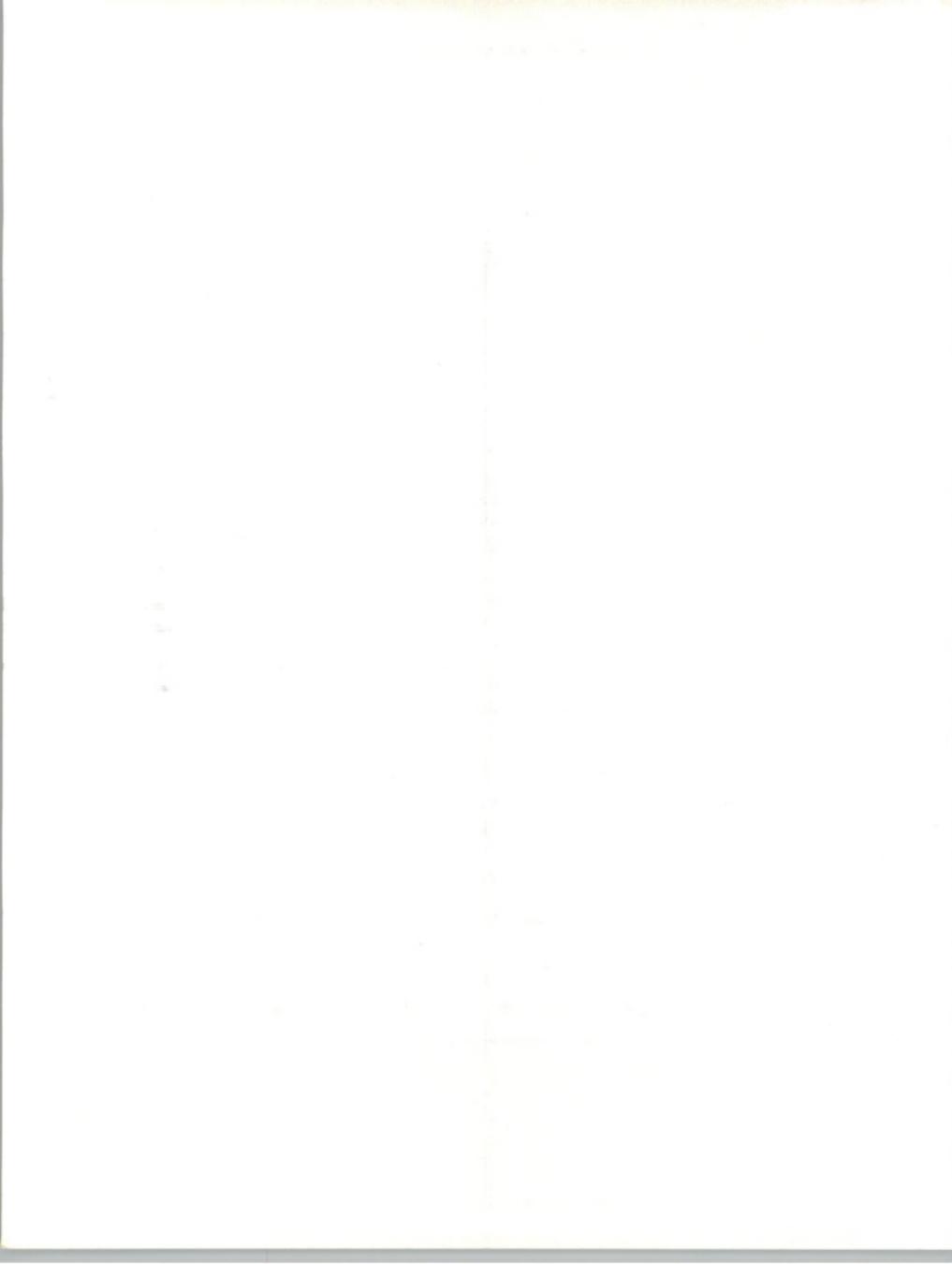
User Issues and Directions

A**Major Issues in State and Local Government**

Major issues impacting state and local government IS programs, according to organizations in the sector, are ranked in Exhibit IV-1.

EXHIBIT IV-1**MAJOR ISSUES IMPACTING STATE AND LOCAL GOVERNMENT IS DEPARTMENTS**

Force or Key Trend	Average Ranking (Where 5 = High and 1 = Low)
Expansion of Available Technology	4.5
More Demand for IS Solutions	4.2
Industry Budget Constraints	3.3
Organizational Issues	3.0
Availability and Use of PCs	2.0



- The issues ranked highest by IS management in this sector are the expanding wealth of powerful technology and the greater reliance on or demand for IS solutions.
- These issues indicate a mounting concern about accomplishing work and the expectation or hope that technology will bring relief. This attitude helps to explain the rapid growth of systems integration projects involved with the implementation of new technology in the sector.
- The organizational and budget constraints that inhibit IS is another major issue. In addition to the rising costs of personnel, equipment, and supplies that are encountered in other sectors, governmental offices have stringent and controlled budgeting and organizational procedures that encumber IS departments.
 - These constraints have encouraged users and executives to find means of circumventing procedures in order to address information system needs.
 - Systems integration contracts have also been utilized to address needs on a basis that will avoid budgeting procedures and constraints.
 - PCs are being employed by end users to run small systems as well as for analysis, spreadsheets, and word processing.
- The spreading use of PCs has resulted in more need and demand for assistance in obtaining and managing data and in using software that, in view of workloads, may be difficult to handle.
- Organizational issues continue to be significant in this sector. There are always questions regarding the authority and role of specific officials in regard to contracts; rules can be reinterpreted by new appointees, elected officials, or other governmental bodies.

The driving forces encountered in this sector are ranked in Exhibit IV-2.

- The rising expectations of key users, officials, and executives for information system solutions is the chief issue affecting IS. "Rising management expectations" has also been identified as the leading major issue affecting IS in INPUT's *IS Planning Report*.
- A management aide in a large city noted that the only way to be successful with the new programs or large program changes desired today for complex social services, courts, criminal justice, or other problems, was either to upgrade information systems capabilities or to hire professional service firms to do so.

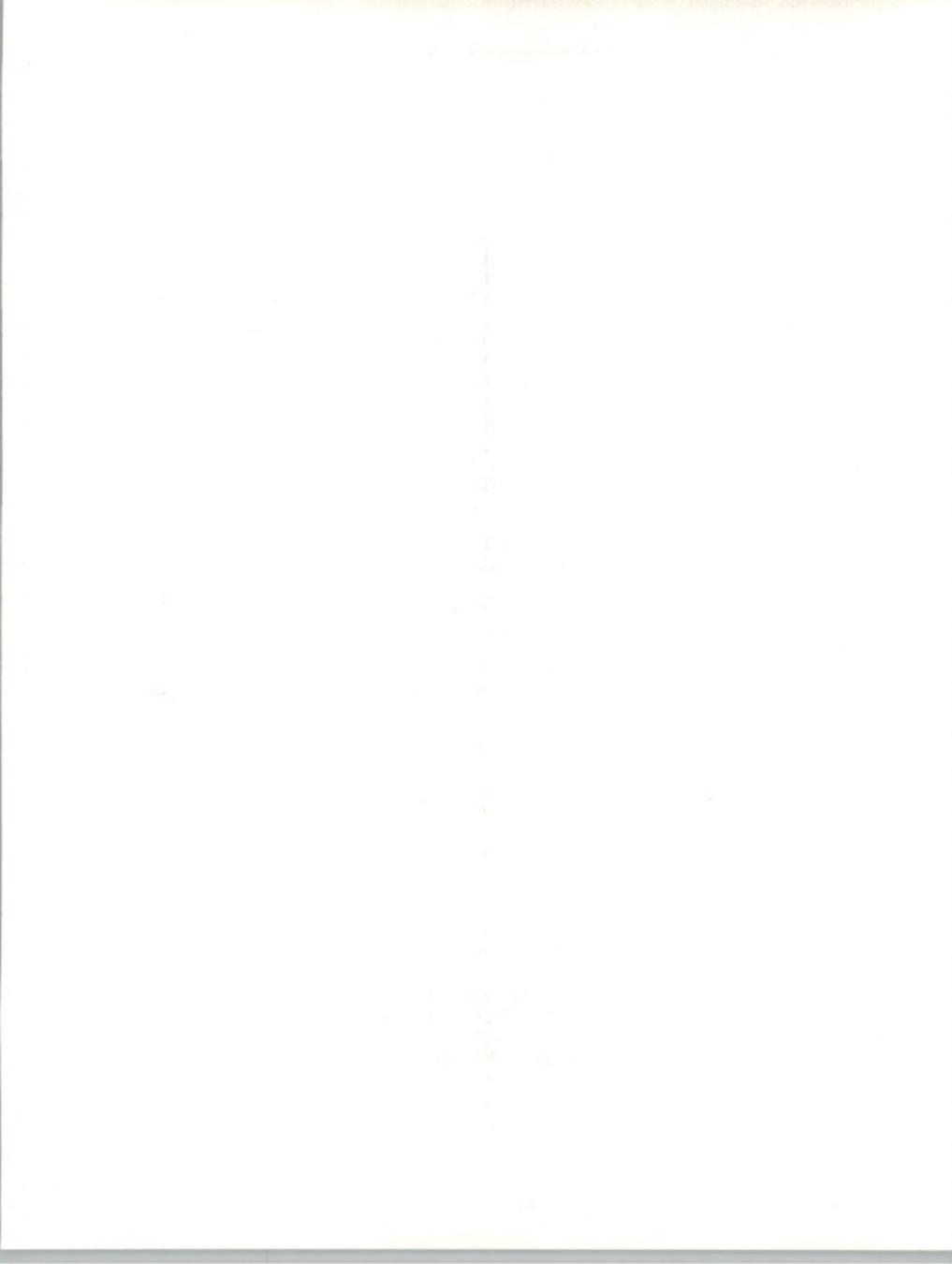


EXHIBIT IV-2

DRIVING FORCES IMPACTING IS DEPARTMENTS

Force	Relative Importance (Where 5 = High and 1 = Low)
Rising Expectations of Key Users, Officials, and Executives	3.8
User Demands for More Complex Solutions	3.8
Reacting to and Planning for Changes in Technology	3.6
Productivity and Backlogs	3.6
Integration of Data/Technology/ Applications	2.0
Budget and Funding	2.0

- IS management recognizes the demand for more complex systems from users as the second facing its organization. This issue was also recognized as critical in the *IS Planning Report*.
- The third that is recognized as critical, “reacting to and planning for changes in technology”, emerges from the primary critical issue: “managing the technical investment.” The state and local government sector tends to lag behind other sectors in responses to technology and is still more concerned with planning for changes in technology than with managing the investment in it.
 - In addition to planning for hardware and software use, IS management in state governments is particularly concerned about planning for networks that, in many cases, are being deployed in a piecemeal fashion.



- Productivity and backlogs are a more critical issue for IS management in this sector than in other sectors. Two IS managers suggested that factors contributing to the backlog were the desires that some state and local government officials have for short-term solutions, which leads to requests for upgrades or improvements.
- Another factor found in this sector, as well as in other sectors as noted in the *ISP Planning Report*, is the integration of data, technology, and applications.
 - In states, large cities, and authorities, there is mounting interest in data base technology and the use of relational data management.
 - Even small municipalities are interested in the integration of applications and the use of data management techniques that will allow expanded use of stored information.
- Budget and funding is also seen as a driving force impacting IS, as well as a key trend of concern in this sector. This is due to the fact that IS executives must pay more attention to the budget and funding process in this sector than may be true elsewhere. Budget line items can be dropped, used for another purpose, or not obtained even though they were approved.

B**IS Budget Analysis**

Key factors affecting the IS budget, according to IS managers, include the following (as highlighted in Exhibit IV-3):

- The development work being discussed and the existing backlog cannot be addressed without a significant increase in available technology, according to a number of IS managers; the cost of the needed technology is a significant concern to them.
- Several IS managers felt that the lack of available technology makes it mandatory to consider the services of information service vendors to meet demands.

The tension that exists between the costs of meeting demands for service and available funding is accentuated by the inclusion of budgets and tax revenues, as well as staff and current development costs, as budget factors. IS management expects changes in tax revenues and the organization's budget to affect the IS budget even for projects or upgrades that are underway.

IS management must be creative and work with government officials and executives to find ways to deliver important systems (mission critical systems) in this type of situation. IS management must clarify manage-

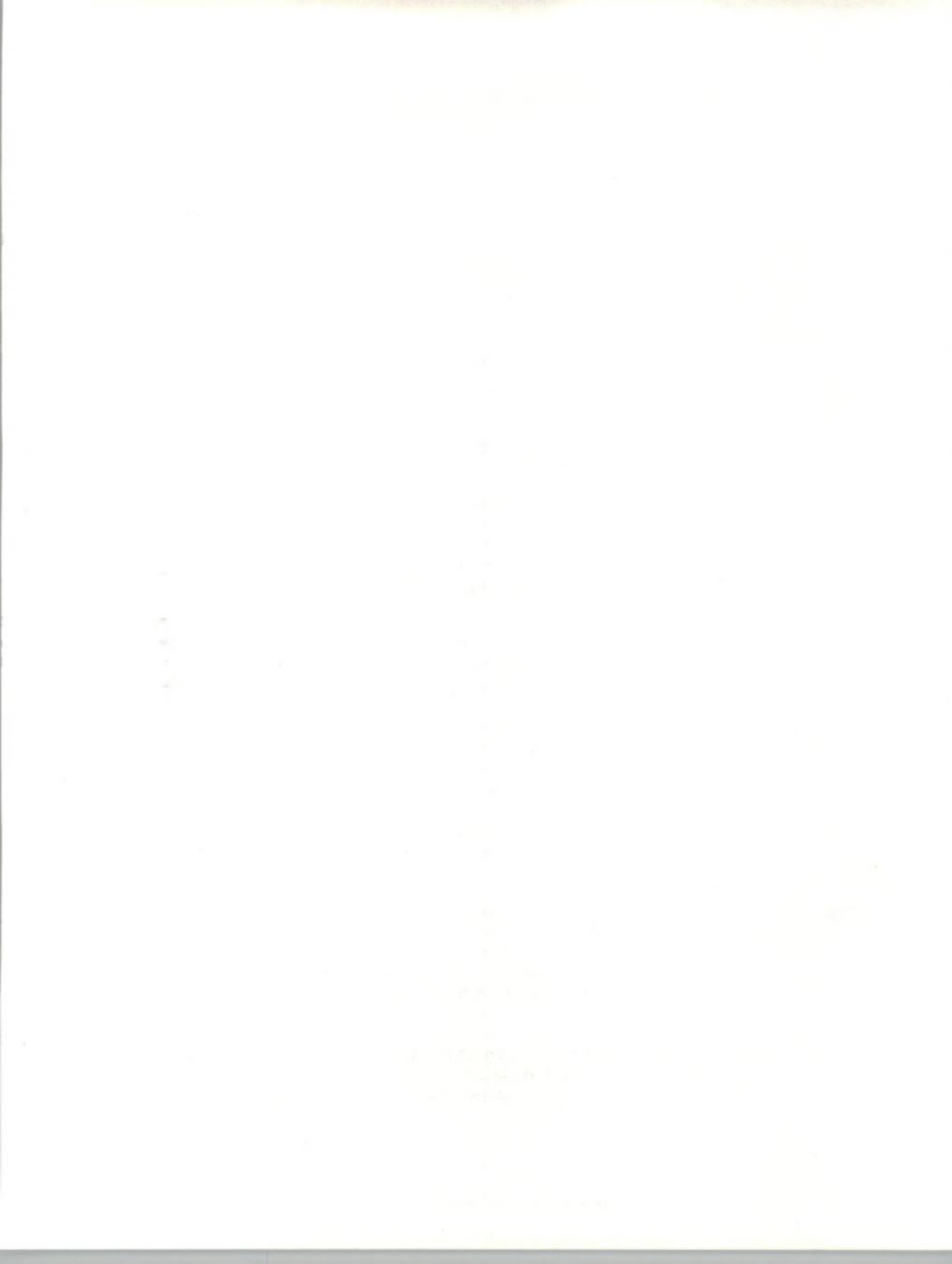


EXHIBIT IV-3

KEY FACTORS AFFECTING THE IS BUDGET

Budget Factor	Average Ranking (Where 5 = High and 1 = Low)
Cost of Technology	4.1
Budgets and Tax Revenues	2.8
Personnel or Staff Costs	2.4
Current Development Needs	2.4
Government Policy-Related Issues	1.8

ment expectations and what resources can be used. If it is acceptable to go outside (or if government executives want to use vendors), IS management must help to scope the effort, resources, and support required to ensure successful projects as well as maintain a position of organizational strength.

The breakdown of the IS budget shown in Exhibit IV-4 indicates that personnel costs are a slightly higher percentage of the budget than in other sectors (41% versus 40% for the average of all sectors in 1988), but that hardware costs are significantly lower (23% versus 28% in 1988), as are communication costs. This explains the significant concern in funding to upgrade technology that is encountered in this sector.

The budget for external products and services is a higher percentage in this sector than the average for all sectors in 1988 (21% versus 16%), compensating for the lower level of expenditures for hardware. Processing was still a significant component of external service but was declining in growth in 1988, while the growth rates of professional services and application software, both over 40%, demonstrate that this sector will maintain a high reliance on vendor service.

Significant growth in hardware and some outside services took place in 1988, although the growth forecast for 1989 is not high for these services. Of course, some professional service and systems integration budgets will be handled separately from in-house budgets.

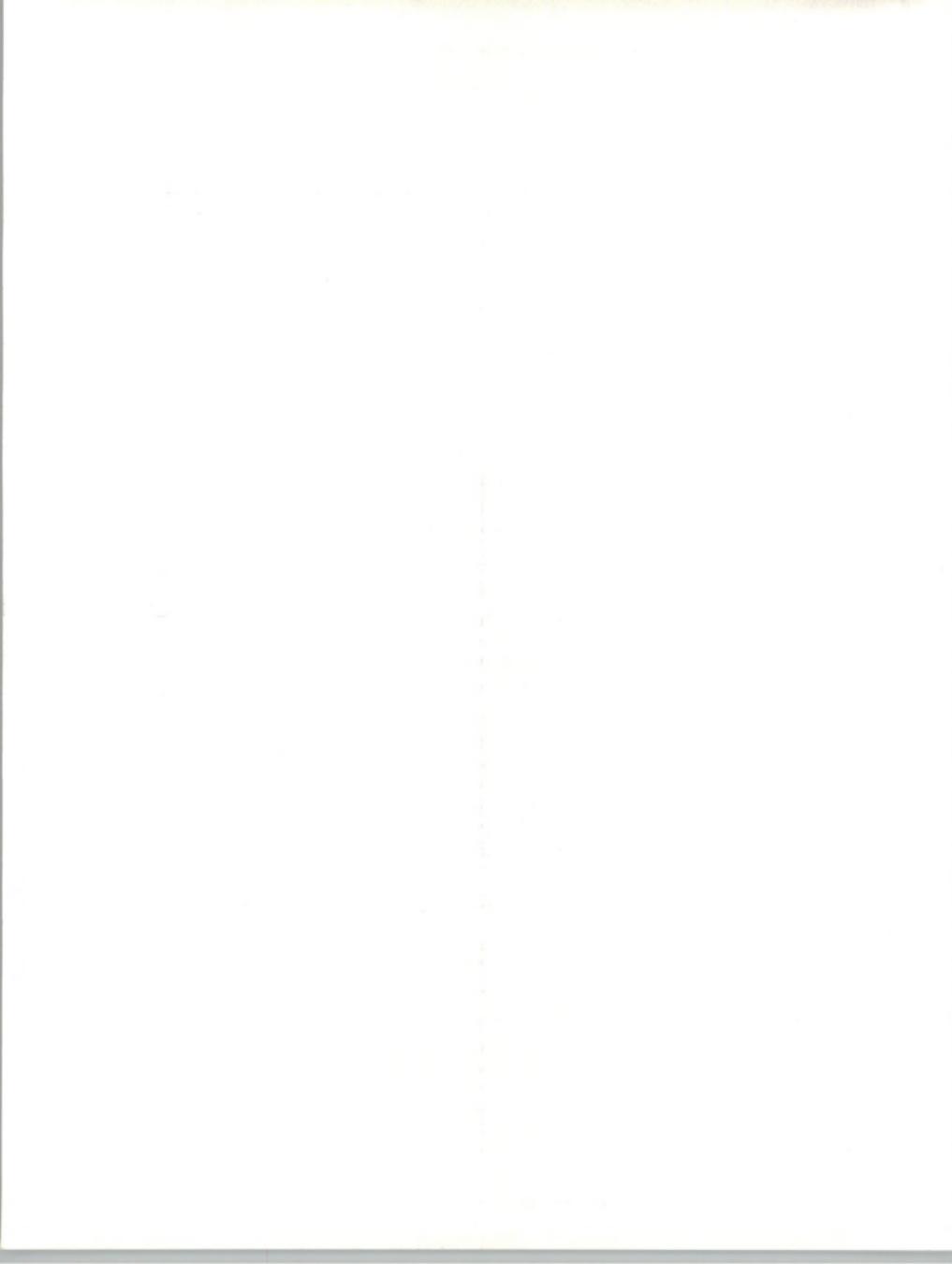


EXHIBIT IV-4

IS BUDGET DISTRIBUTION AND GROWTH

Category	Percent			
	1987 Budget	1988 Budget	1988 Growth	1989 Growth
Personnel	43.0	41.0	0.0	6.0
Hardware				
Mainframes	9.6	11.5	26.0	4.0
Minicomputers	3.0	3.5	(13.0)	11.0
PC/Workstation	2.2	2.3	10.0	10.0
Mass Storage	3.5	3.5	5.0	4.0
Other	3.7	3.2	(9.0)	6.0
Total Hardware	22.0	24.0	10.0	4.0
Communications	7.0	8.0	20.0	6.0
External Products & Services				
Professional Services	2.0	2.7	49.0	4.0
Processing Services	3.6	2.9	(16.0)	4.0
Applications Software	1.7	2.3	42.0	1.0
Systems Software	4.4	4.6	10.0	0
Turnkey Systems	2.0	1.9	5.0	0
Software Maintenance	2.3	1.9	(13.0)	1.0
Hardware Maintenance	3.8	3.5	(3.0)	8.0
Other	1.4	1.0	(25.0)	1.0
Total External	21.0	21.0	5.0	6.0
Other	7.0	7.0	5.0	(3.0)
Total Budget	100.0	100.0	4.8	5.5



Overall, the IS budgets for organizations in this sector increased on the average in 1988 over 1987, as shown in Exhibit IV-5. Expenditures in 1985 by major government function for state and local governments, from the *1988 Statistical Abstract of the United States*, are delineated in Exhibit IV-6.

EXHIBIT IV-5

**IS BUDGET GROWTH SUMMARY
(1988 VERSUS 1987)**

Change in IS Budget	State & Local Government (Percent of Respondents)
Increase	59
Decrease	14
Unchanged	27
Total	100



EXHIBIT IV-6

**STATE AND LOCAL
GOVERNMENT EXPENDITURES
BY GOVERNMENT FUNCTION**

Government Function	State Gov't Expenditures 1985 (\$ M)	City Gov't Expenditures 1985 (\$M)
Direct General Expenditures	223,562	328,538
Highways	27,167	17,854
Public Welfare	52,688	16,888
Health & Hospitals	23,211	26,467
Police Protection	3,114	17,843
Local Fire Protection	—	8,917
Natural Resources	7,968	9,549
Sanitation & Sewage	328	17,070
Housing & Community Development	1,034	9,344
Government Administration	10,920	17,971
Interest on General Debt	14,982	17,445
Utility Expenditures	5,364	51,611
Insurance Trust Expenditures	37,940	6,251
Other	20,112	25,722
Education	53,667	139,019

Total Number of State and Local Government Entities, 1987: 83,216

Source: *Statistical Abstract of the United States, 1988*



C**Application Development Trends**

As might be expected, a significantly higher percentage of organizations in this sector reported increases in their application backlogs versus organizations in other sectors (62% versus 42% in 1988) which is illustrated in Exhibit IV-7.

EXHIBIT IV-7**APPLICATION BACKLOG
(1988 VERSUS 1987)**

Change in Backlog	State & Local Government (Percent of Respondents)
Increase	62
Decrease	9
Unchanged	29
Total	100

The growth of backlogs has resulted in a lower allocation of internal resources to developing systems, as shown in Exhibit IV-8.

- State and local government organizations are forced to rely more upon external resources than many other industry sectors. INPUT's industry survey indicated they rely on external resources approximately 14% of the time versus 9% for the average of all sectors and on a combination of external and internal resources about 32% of the time versus and estimated 15% for all sectors.

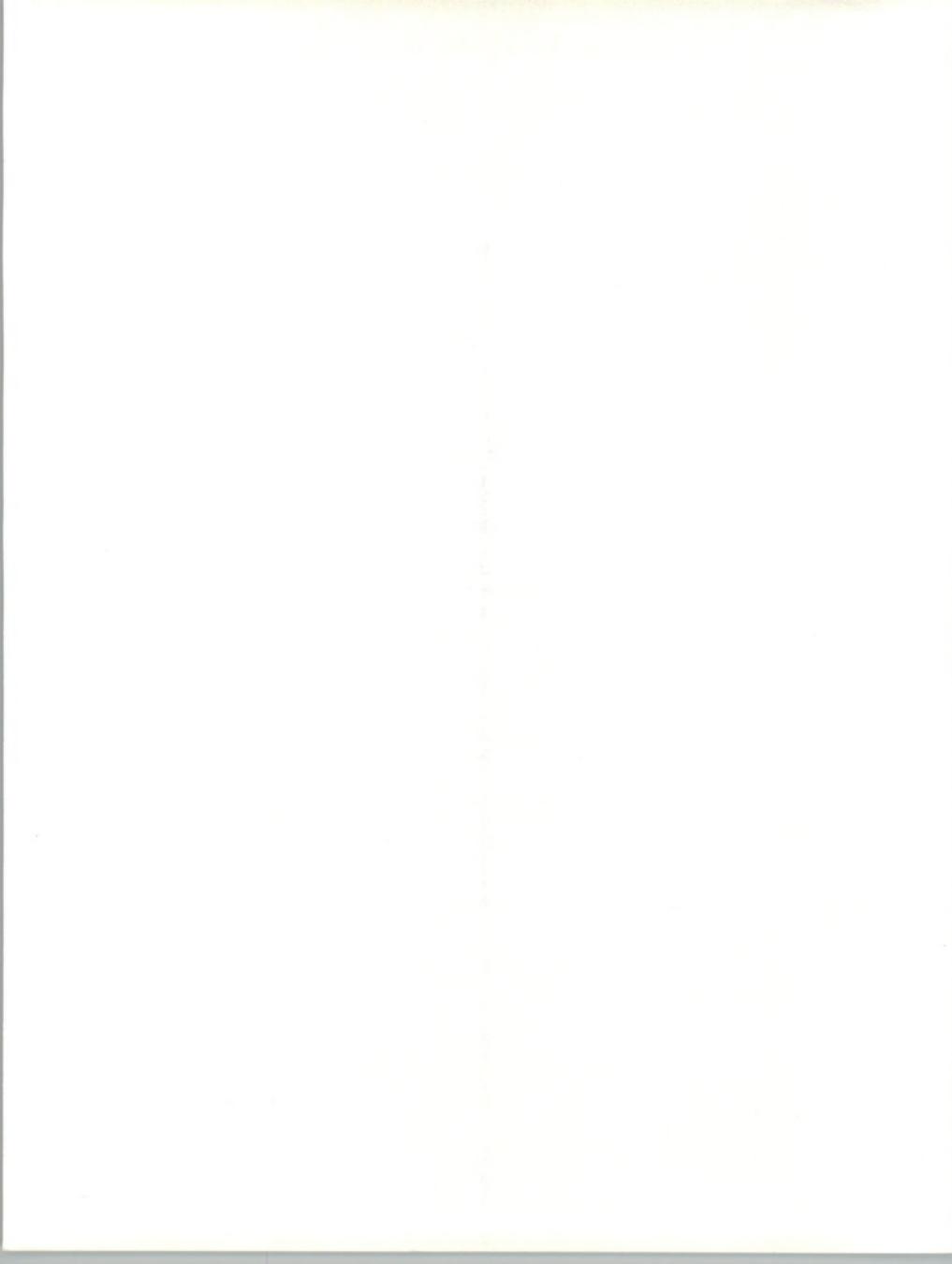
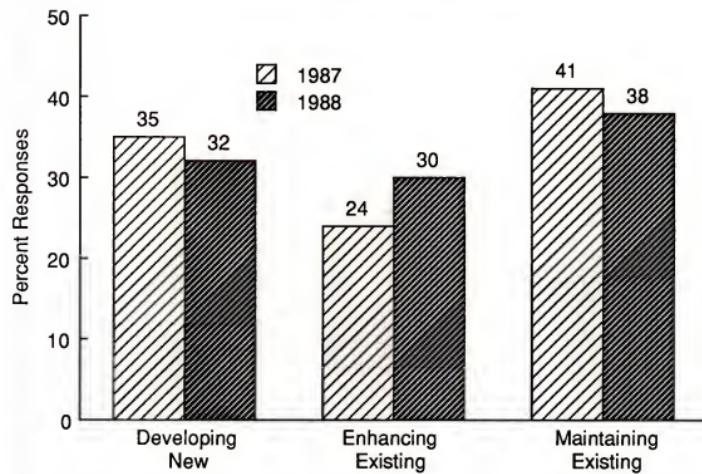


EXHIBIT IV-8

ALLOCATION OF INTERNAL DEVELOPMENTAL RESOURCES



The type of external resource utilized by this sector is not that different from other sectors. Only slightly more use is made of custom development versus package software. However, the professional service and systems integration work that is not counted in IS budgets would shift the percentage more towards custom development.



EXHIBIT IV-9

APPLICATION DEVELOPMENT
SOURCE OF RESOURCES

Category	State & Local Government (Percent of Respondents)
Type of Source	
Internal	54
External	14
Combination	32
Type of Development	
Package Software	34
Custom Development	66

D

Objectives and Plans

IS management objectives, ranked in Exhibit IV-10, reflect concerns about the combination of backlog pressures (Exhibit IV-2), inadequate hardware, and budget constraints.

Although IS management feels the need to relieve pressure on the backlog and current development before addressing planning, it will be necessary to initiate planning activities with government executives and officials to clarify their objectives and the need for critical systems to determine priorities, and to ascertain whether additional funding or outside resources can be used to reduce the backlog.



EXHIBIT IV-10

INFORMATION SYSTEMS MANAGEMENT OBJECTIVES

Objectives	Average Rating among Respondents (Where 5 = High and 1 = Low)
Upgrade Hardware	4.5
Upgrade Software Development Capabilities	4.2
Increase Connectivity or Network Capabilities	3.8
Make Greater Use of Information	3.2
More Strategic Planning	2.8

City and state organizations have a wide variety of new application areas, but certain ones achieved a higher current ranking among INPUT's respondents as shown in Exhibit IV-11.

- On-line claims eligibility for unemployment or welfare is an important application due to the significant interest in reducing fraudulent or erroneous payments and paper work.
- Computer-aided dispatching to meet public safety or service needs ranks high as well.
- Applications to make more use of current data, including the use of spreadsheets or modeling systems to examine financial data, are also widely reported.
- Court and criminal justice systems are planned by states and cities to replace older systems, as well as to address growing public concerns.

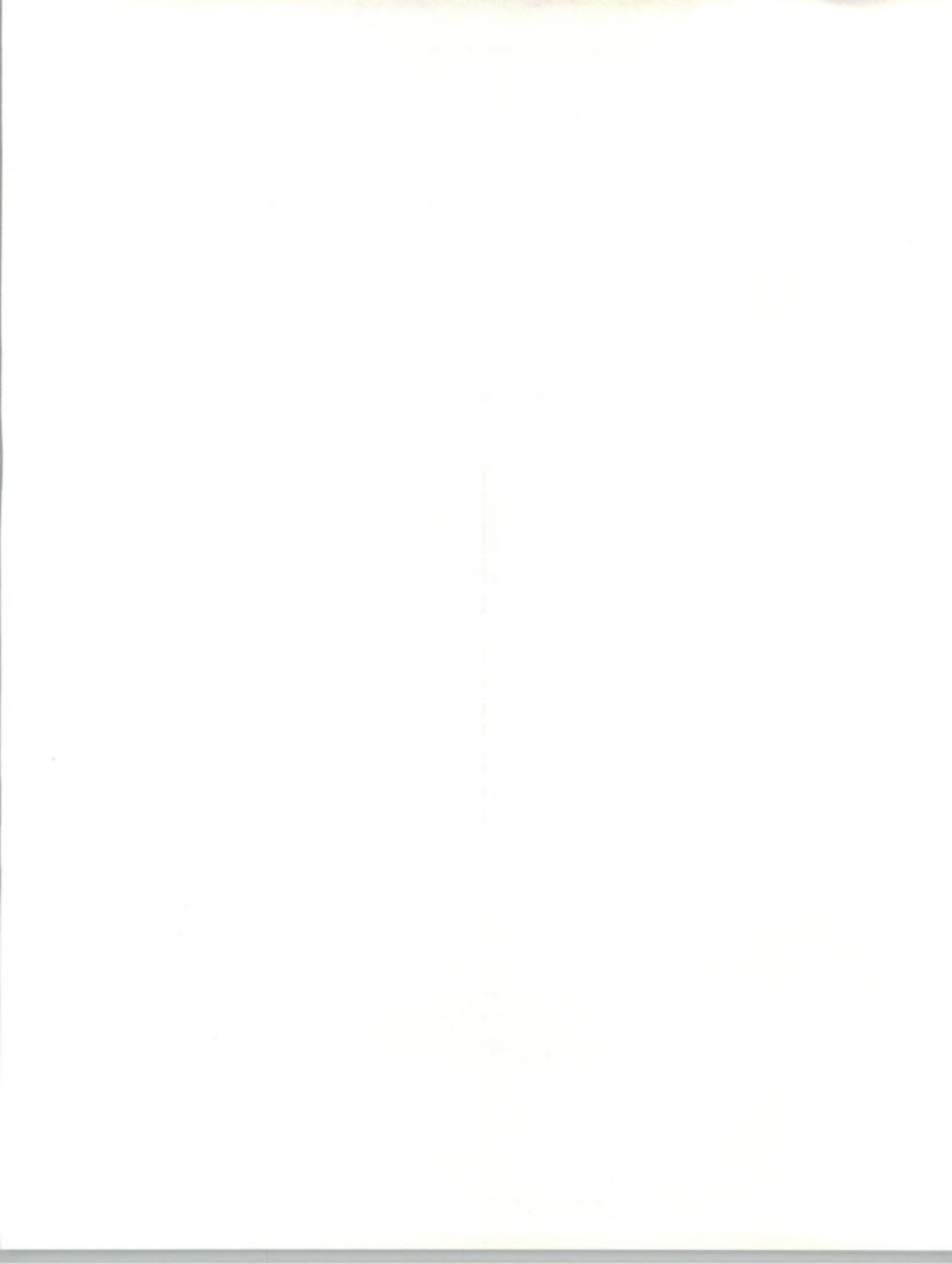


EXHIBIT IV-11

NEW APPLICATION AREAS

New Application Areas	Average Rating among Respondents (Where 5 = High and 1 = Low)
On-Line Eligibility and Claims Processing	3.8
Computer-Aided Dispatching	3.2
Data Retrieval	3.2
More Use of Information	3.2
DSS	3.1
Court and Criminal Justice Systems	3.0

New technology implementation planned for state and local government IS programs that were reported among INPUT's survey respondents are ranked in Exhibit IV-12.

- The highest ranked plan, the improvement of system development methods, responds to the need to reduce the large backlog and handle current development plans.
- The second ranked item, the use of new I/O technology to aid in obtaining data from or responding to users and the public, addresses a special need of this sector. The need to improve the ability to gather and supply data emphasizes the importance of information.
- Network/connectivity and distributed processing, the next ranked items, highlight the expanding use of on-line systems and of communications between offices and to points of public use of system capabilities. Many governmental applications are being changed by the increasing use of technologies that improve connectivity and the ability to access data.

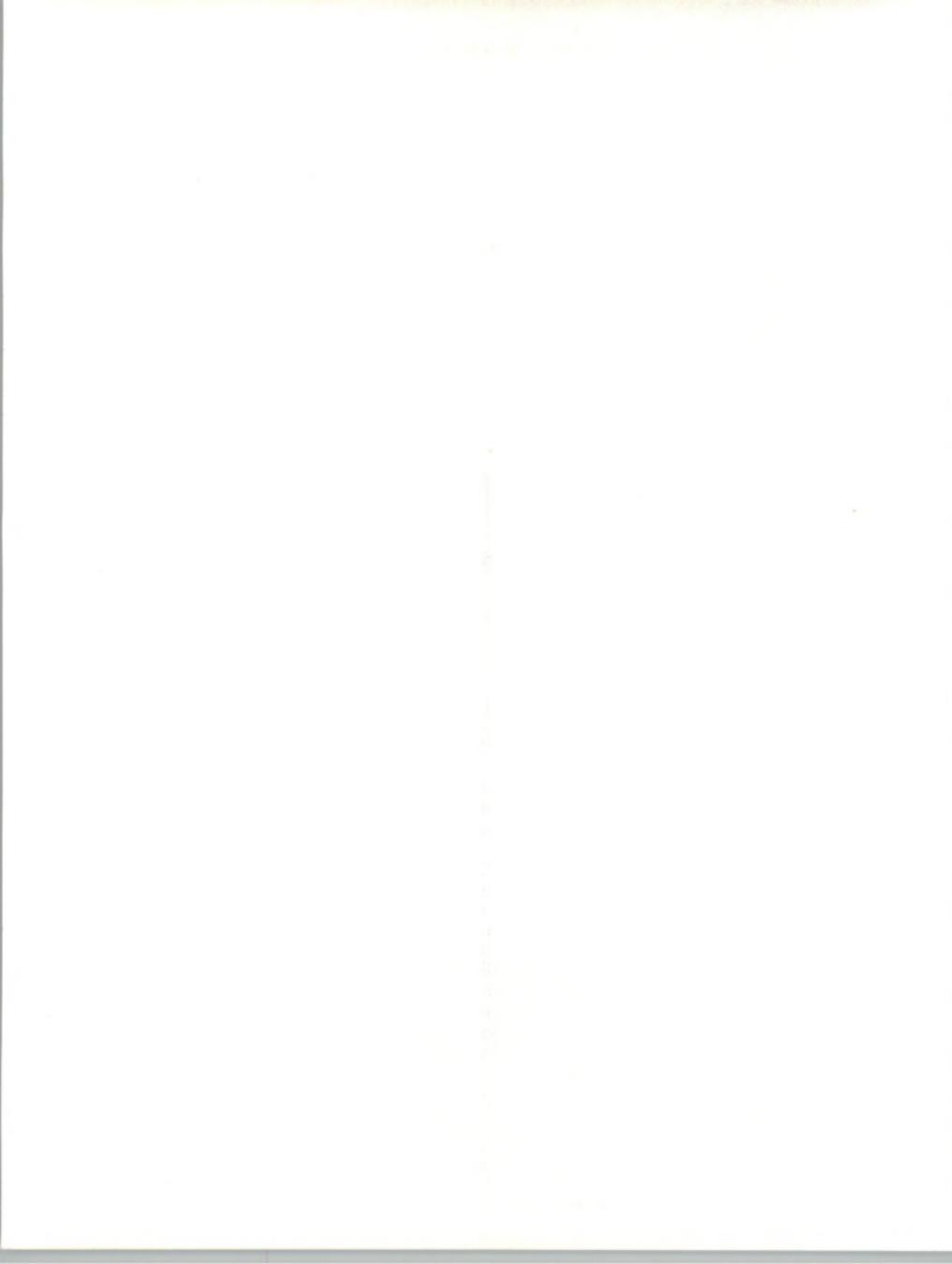


EXHIBIT IV-12

NEW TECHNOLOGY IMPLEMENTATIONS PLANNED

New Technology	Average Rating among Respondents (Where 5 = High and 1 = Low)
4GL and CASE to Increase Productivity	3.5
I/O Technology (Data Entry, Image, Voice)	3.3
Networking and Connectivity	3.3
Distributed Processing	3.1
Increased Data Storage and Data Management	3.1

- The final item noted, plans for increased data storage and management technology, is required to meet the rapid growth of system use and storage of data. A number of IS managers in this sector are considering the use of relational technology to meet the needs for organizing and presenting data that are characteristic of government organizations.





Opportunities and Recommendations

Compared to the private sector, state and local government organizations are more likely to seek the assistance of information system vendors to address the large-scale tasks and programs that confront them.

- Many vendors do not respond to requests for information or quotes issued by organizations in this sector. The vendors may not track these requests or be aware of them.
- Many vendors do not use a consultative approach in this sector; they fail to provide the aid, ideas, or forewarnings of problems that could lead to contracts in the future.

Tracking government requests and providing aid can assist vendors in gaining business in this sector, particularly in the fast-growing systems integration business.

Larger vendors may find many opportunities in software application packages offered by smaller vendors. Many of these projects are not marketed aggressively nationwide or integrated with other software (e.g., accounting) that could be sold simultaneously.

The need to upgrade capabilities in this sector provides an opportunity for vendors of data base and network products to enter the sector or expand business within it.

- Relational technology is needed to meet the reporting requirements for human resource or financial applications.
- Regional or statewide networks are needed for financial, human resource, criminal justice, and other needs.



Financial modeling capabilities and more flexible budgeting and accounting systems are needed to meet cost reduction and control programs and to administer funding for new programs.

SL-A

Appendix: Definitions Pertinent to the State and Local Government Sector

Functionally, state and local governments can be categorized into the following areas:

- Executive, Legislative, and General Government
- Justice, Public Order and Safety
- Public Finance, Taxation, and Monetary Policy
- Administration of Human Resources Programs
- Administration of Housing and Environmental Quality Programs
- Administration of Economic Programs

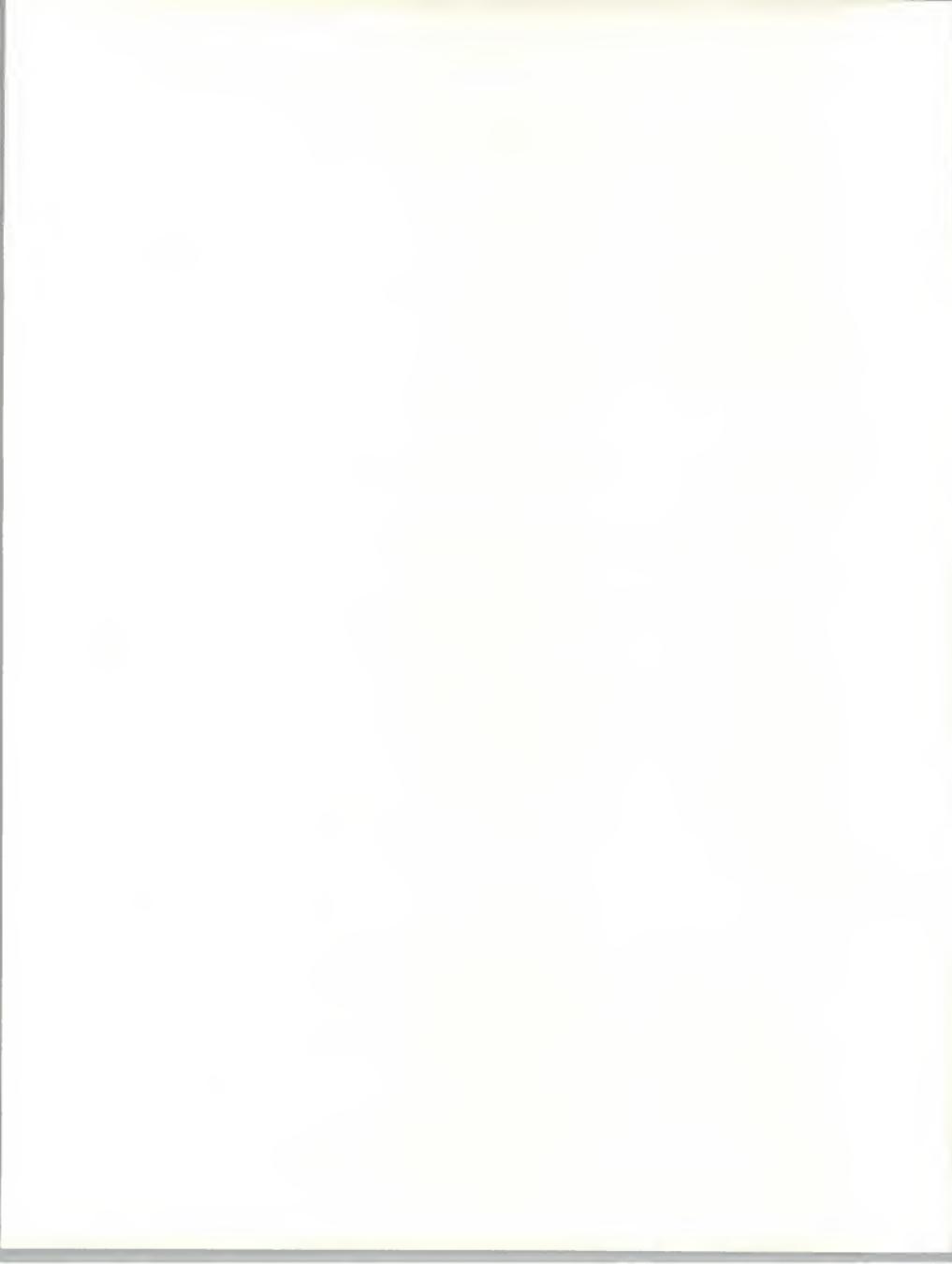
Executive branches of government includes city managers' offices, mayors' offices, county supervisors' offices, governors' offices, and executive advisory commissions.

Legislative bodies include boards of supervisors, city councils, county commissioners, and legislative assemblies and advisory commissions.

General government includes general accounting offices, government personnel agencies and boards, purchasing and supply agencies, and more.

Applications used by executive, legislative, and general government include the following:

- Government Personnel
- Applicant Tracking
- Employee Management and Compensation
- Government Payroll
- Purchasing
- Inventory Management
- Voter Registration
- Election Returns
- Integrated Municipal System



On the state and local government level, the justice system includes traffic courts, district courts, family courts, superior courts, and many other types of courts.

Public order and safety includes state police and highway patrols, city police departments, ad sheriff's offices; fire protection; legal counsel and protection, such as public defenders' offices and public prosecutors' offices; and correctional institutions.

Applications used by the justice system and public order and safety organizations include the following:

- Remittance Control for Courts
- Correctional Institutions Control
- Information Management Systems for Law Enforcement
- Computer-Aided Dispatch for Public Safety
- Police Systems
- Crime Analysis
- Crime Reporting and Criminal Information
- Traffic Ticketing and Enforcement
- Equipment Control
- Fire Systems
- Automatic Vehicle Locating Systems

Public finance, taxation and monetary policy includes organizations primarily engaged in financial administration and taxation, such as budget agencies, controllers' offices, property tax assessors' offices, state tax commissions, tax departments, and treasurers' offices.

Applications used in public finance, taxation and monetary policy include the following:

- Tax Collection
- Budgetary Accounting
- Central Cashiering
- Fund Accounting Management Information Systems
- Financial Control
- Fiscal Management and Reporting
- Government Costing
- Municipal Controls Systems
- On-Line Appraisal and Statistical information
- Real Property Tax
- Tax Management
- Revenue Data Collection
- Treasurers' General Ledger and Warrant Reconciliation
- Tax Assessment and Management

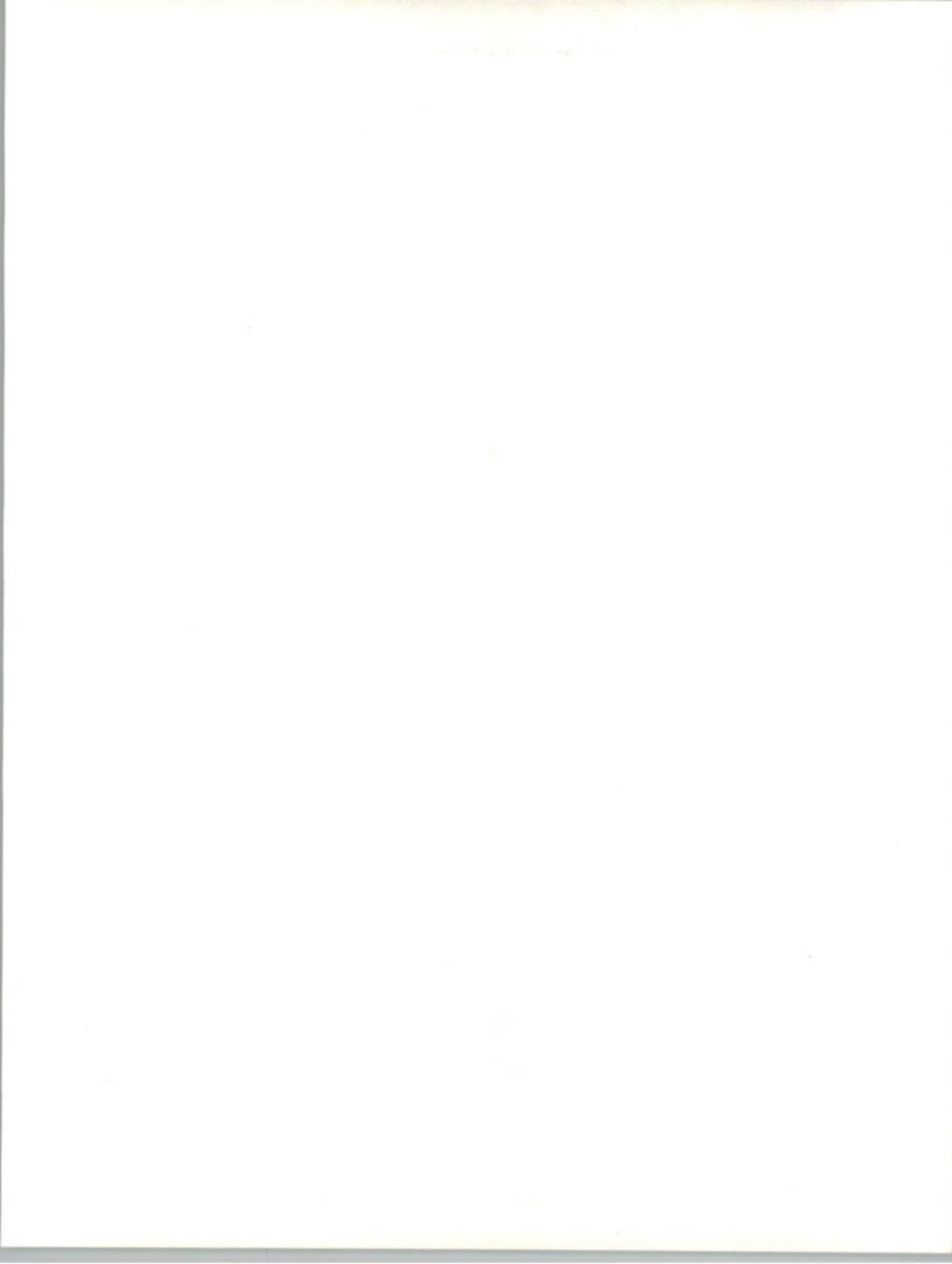
Administration of Human Resources includes the administration of educational programs, public health programs, and social, manpower and income maintenance programs. Within this group are county supervisors of education, state education departments, teacher certification bureaus, health statistics centers, immunization program administration, maternity and child health agencies, equal employment opportunities offices, medical assistance program administration, unemployment insurance offices, workman's compensation offices, and more.

Administration of Environmental Quality and Housing Programs includes administration of environmental programs and administration of housing and urban development programs. Within this group are environmental protection agencies, environmental quality and control agencies, sanitary engineering agencies, water control and quality agencies, conservation agencies, land management agencies, building standards agencies, housing agencies, community development agencies, county development agencies, urban planning commissions, and zoning boards and commissions.

Administration of Economic Programs includes administration of general economic programs, regulation and administration of transportation programs, regulation and administration of communication, electric, gas, and other utilities, and regulation, licensing, and inspection of miscellaneous commercial sectors. Although this group includes many federal agencies, it also includes consumer protection offices, motor vehicle licensing and inspection offices, port authorities and districts, railroad and warehouse commissions, transit systems and authorities, transportation departments, irrigation districts, licensing and inspection of utilities, alcoholic beverage control boards, labor management negotiation boards, licensing and permit for retail trade, rent control agencies, work safety administration, and more.

Applications developed for public administration are abundant; listed below are some of those.

- Financial Accounting Systems for Education
- Welfare and Public Assistance Control and Licensing
- Animal Control and Licensing
- Building Permit
- Business License
- Land Parcel Data Base
- Building and Zoning
- Highway Impact Model
- Housing Authority Tenant Accounting
- Truck Trailer Scale System
- Title System



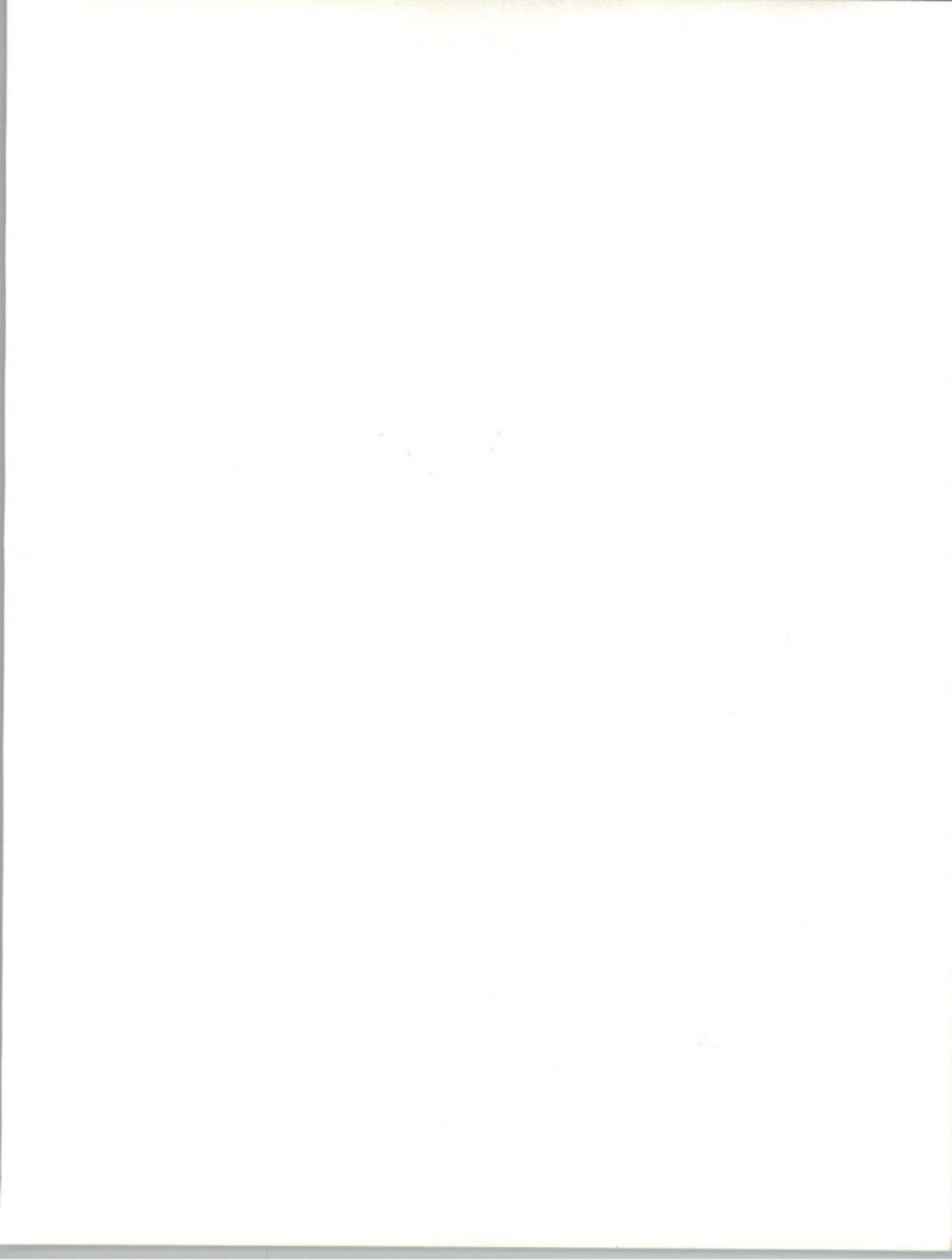
SL-B

Appendix: State and Local Government Sector Data Base

EXHIBIT SL-B-1

**STATE AND LOCAL GOVERNMENT SECTOR
USER EXPENDITURE FORECAST BY DELIVERY MODE, 1988-1993
(In Millions of Dollars)**

Sector by Delivery Mode	1987	Percent Growth 87-88	1988	1989	1990	1991	1992	1993	Percent CAGR 88-93
Total State & Local Government Sector	2,780	18	3,280	3,755	4,340	4,985	5,720	6,580	15
Processing Services	650	13	740	855	1,000	1,160	1,330	1,550	16
Transaction Processing Services	160	20	190	220	260	300	340	400	16
Systems Operations	490	11	550	635	740	860	990	1,150	16
Network/Electronic Information Services	40	27	50	60	80	95	120	150	26
Electronic Information Services	20	32	25	30	40	45	50	60	19
Network Applications	20	22	25	30	40	50	70	90	33
Application Software Products	65	29	90	100	130	160	210	250	24
Mainframe	30	24	40	40	50	60	70	80	16
Minicomputer	15	27	20	20	30	30	40	40	17
Workstation/PC	20	36	30	40	50	70	100	130	34
Turnkey Systems	110	12	120	140	160	180	200	220	13
Systems Integration	260	44	380	470	580	720	870	1,060	23
Professional Services	1,655	15	1,900	2,130	2,390	2,670	2,990	3,350	12





About INPUT

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions.

Continuous-information advisory services, proprietary research/consulting, merger/acquisition assistance, and multiclient studies are provided to users and vendors of information systems and services (software, processing services, turnkey systems, systems integration, professional services, communications, systems/software maintenance and support).

Many of INPUT's professional staff members have more than 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed as a privately held corporation in 1974, INPUT has become a leading international research and consulting firm. Clients include more than 100 of the world's largest and most technically advanced companies.

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